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GENITAL TUBERCULOSIS.*

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If the mode of entry of an infection is unknown and the method of treatment is uncertain, interest in the subject is always aroused. Tuberculosis of the genital tract is no exception to this rule, as a review of the literature will show. Is the disease primary in the epididymis, vesicles, or prostate? How often is the urinary tract also involved? Should epididymectomy be performed? Is removal of the entire seminal tract preferable to epididymectomy? If epididymectomy is performed what are the chances of the remaining epididymis becoming involved? Can epididymectomy be considered a curative procedure or only a palliative one? What are the chances of formation of sinuses postoperatively? If they occur, how long do they persist? What is the life expectancy in these cases? If treatment is not instituted what will be the outcome? What are the determining clinical signs of tuberculous and non-tuberculous epididymitis? These are some of the many questions uppermost in the physician's mind when he encounters a case of tuberculous epididymitis.

With these questions in mind, we have reviewed 300 cases which we observed at The Mayo Clinic prior to January, 1923. One hundred and seventy-five of the patients were operated on. The cases occurring within the last five years have been excluded in order that the final results might be better determined.

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DIFFERENTIAL DIAGNOSIS.

In the diagnosis of tuberculosis of the genital tract evidence of a tuberculous lesion elsewhere should be looked for, naturally in the urinary tract first. If it is found, the probabilities are that the thickened epididymis is tuberculous. In seventy-five of our cases dysuria was present and in all but seven renal tuberculosis was demonstrable. The indications are that dysuria is strong presumptive evidence of urinary tuberculosis and not a common symptom of genital tuberculosis.

In 112 of the 175 surgical cases, all verified by microscopic examination or removed tissue, there was no sign of tuberculosis other than that of the genital tract. In the remaining cases there was evidence of pulmonary involvement in thirty-six, of renal involvement in thirty-three, of disease in the bones or joints in nineteen, and of disease of the lymphatics in eight, giving a total of 54.8 per cent of associated tuberculosis outside of the genital tract.

If associated tuberculous lesions are not demonstrable, a diagnosis of acute tuberculous epididymitis must not be made too hurriedly for in acute cases tuberculous and non-tuberculous infections appear very similar in the prostate and vesicles. As time goes on the non-tuberculous infection

in the prostate and vesicles subsides, while the tuberculous infection tends to progress. The prostate was involved in 52 per cent of our cases. It was described as irregular, firm and nodular; occasionally one had softened areas.

The history of previous epididymectomy, orchidectomy, or the incision of a scrotal abscess has justly been considered strong evidence that the lesion of the remaining epididymis is probably tuberculous. The presence of a discharging sinus is almost pathognomonic, although in some instances it may indicate gumma. Tuberculous sinuses are usually posterior, while those from gumma are more likely to be anterior. Ninety-seven of the patients in our series had received surgical treatment previously; fifty-eight incision of scrotal abscesses, six epididymectomy, and thirty-three orchidectomy; 108 patients had discharging sinuses.

As the non-tuberculous lesions are usually unilateral, the presence of bilateral epididymitis probably favors a tuberculous origin.

PRIMARY SEAT OF INFECTION.

To answer the question regarding which of the genital organs will be involved first in a tuberculous infection appears to be almost hopeless. It is possible that any one of the organs may be initially involved. The main arguments relative to treatment, however, depend on the settling of this point. If the epididymis can be shown to be the initial site of the disease, the simple procedure of epididymectomy becomes logical. If, on the other hand, it is shown that the disease originates in the prostate or seminal vesicles, the radical removal of the seminal tract would be the logical procedure.

Those who believe that the prostate is the initial site of the disease point out that when apparently recent tuberculous lesions are found in the epididymis the process is usually far advanced in the prostate and vesicles and that the lesion usually develops in the lower pole of the epididymis, where it would be expected that infection by way of the vas deferens would first appear.

Young, in a most comprehensive article on the subject in which he advocates the radical removal of the entire seminal tract, asserts that the primary focus is in the seminal vesicles.

Clinical evidence seems to indicate that the disease is primary in the epididymis for there are innumerable incidences in which examination of the prostate after epididymectomy shows that, where formerly the prostate was firm and nodular, it has become much smoother and softer and frequently scarcely palpable. The same is true of the seminal vesicles.

In twenty-five cases in our series in which subsequent examination was made some time after epididymectomy the prostate and seminal vesicles appeared to be normal; in thirty-five others it was nodular, but apparently not causing trouble. In only one case was a subsequent operation on the prostate or vesicles necessary.

Involvement of one seminal vesicle was noted in sixty-eight cases in all of which the epididymis on the same side was affected. In sixteen of these the opposite epididymis was also involved, although the vesicle on that side felt normal.

This would suggest that the infection did not travel through the vesicles to the other epididymis, but that it was primary in the epididymis, and seems to explain the improvement noted following epididymectomy.

ASSOCIATED URINARY INFECTION.

There are many references in the literature to the incidence of genital tuberculosis as a complication of urinary infection. Braasch in 1920, reporting 234 cases of renal tuberculosis, noted that there was genital infection in 171 (73 per cent). It is difficult to find in the literature estimates of the percentage of urinary tuberculosis complicating genital infection.

In our series of 300 cases renal tuberculosis was found to be present in 110 and developed after epididymectomy in seven. It would seem that there is a 36 per cent chance of the association of renal tuberculosis with tuberculosis epididymitis. Since in 35.7 per cent of the cases of bilateral involvement there was renal tuberculosis and since in 37.1 per cent of the cases of unilateral involvement there was renal infection the chances of an associated renal tuberculosis seem about equal whether the epididymis is involved on one or both sides.

In fifty-three cases in which only one kidney was affected the epididymis on the same side was affected in twenty-three cases, on both sides in twenty-one, and on the opposite side in only nine. There appears to be an overwhelming chance that when there is associated renal tuberculosis it will be found on the side of the affected epididymis.

ANALYSIS OF URINE.

Microscopic examination of the urine was made in 293 cases. It was negative for the bacilli of tuberculosis in ninety-two and positive in sixty-four. Thirty-six of the latter were in the surgical group and renal tuberculosis was demonstrated in all but five. Two of the patients died within three years, presumably of renal tuberculosis; nephrectomy for tuberculosis was done later in two cases and the fifth patient died of cardiac disease. This would seem to indicate that bacilli of tuberculosis are rarely found in the urine in cases of tuberculous epididymitis unless there is also tuberculosis of the kidney.

INVOLVEMENT OF THE REMAINING EPIDIDYMIS.

In 109 of our cases, approximately one-third, bilateral involvement was noted on examination and involvement of the remaining epididymis was noted in thirty-eight cases, the other having been previously removed, presumably because of tuberculous infection. With these percentages in mind it is interesting to note the incidence of involvement of the remaining epididymis following epididymectomy. Keyes says, "Be the operation ever so slight or ever so radical, relapse on the other side almost invariably occurs."

In our series of 175 surgical cases there were only eighty-nine in which extension to the remaining epididymis was possible because of previous operation or infection. Seventy-one patients are living and twenty-eight (39 per cent) have tuberculosis in the remaining epididymis.

It would appear that epididymectomy does not tend to lessen the involvement of the remaining epididymis, yet the fact that in 82 per cent of the cases it became involved within one year after operation indicates the possibility that it was microscopically involved at the time of operation and became noticeable grossly during the year. If this is true, the operation is responsible for the low incidence of extension later, since during the second year only 6.5 per cent became involved, and from two to ten years but 10 per cent. After this time involvement was infrequent.

SINUS FORMATION.

Epididymectomy, while primarily intended to prevent extension of the disease, also at times removes and prevents sinus formation. Unfortunately this is not always the case, for, as in all tuberculous processes, sinuses develop. In our 175 surgical cases healing occurred within a month in seventy-two and during the first year in seventy-five. In eight cases a sinus persisted for two years and in two for seven years. Several of the patients in replying to our questionnaire volunteered the information that healing did not commence until they exposed themselves to sunlight, following which healing was rapid.

PROGNOSIS

Of the series of 175 patients treated surgically eighty-five are known to be alive for from five to seventeen years after operation. Thirteen others were in good health when heard from during the five

year period but did not answer the questionnaires. As these were not returned from the post office, the probability is that they were received and not answered. In this event 56 per cent of the patients are alive more than five years. Eighteen patients (10.2 per cent) died from tuberculosis of the urinary tract; nephrectomy had been performed on sixteen of these at the time of their examination. Seven others who were free from renal tuberculosis at the time of operation later contracted the disease. Fifteen patients (8.6 per cent) died of pulmonary tuberculosis. Four died from other forms of tuberculosis, making a total of 21 per cent of cases in which death was attributed to tuberculosis. If we consider that all patients not heard from have died from tuberculosis and exclude nine who died from other causes, there is 61 per cent of good results. These good results we attribute to the large percentage of cases of renal tuberculosis discovered at the time of examination, and to the prompt surgical treatment. This is further emphasized by the low incidence (10 per cent) of later deaths from renal tuberculosis.

Forty of our patients had atrophy of the testicle following operation and thirty did not: a four to three chance that the testicle will atrophy following epididymectomy. Since there appears a 39 per cent possibility of extension to the other side with the necessity of a second epididymectomy, the possibility of bilateral atrophy would seem a serious contra-indication to surgery. Unless suppuration is present or evidently will occur and there is annoying weight and pain, heliotherapy where available should certainly be carefully considered as an alterative to surgery. Unfortunately, few can spare the time or bear the expense for this form of treatment and so for the majority, surgery offers the most available chance of relief.

CONCLUSIONS.

In conclusion it may be emphasized that:

1. Dysuria is a symptom of urinary tuberculosis and does not occur when the disease is confined to the genital tract.

2. The presence of the bacilli of tuberculosis in the urine indicates renal involvement.

3. Unless the urine is negative microscopically, cystoscopy should be done in all cases of chronic tuberculous epididymitis.

4. Involvement of the remaining epididymis may be expected in 39 per cent of cases following epididymectomy.

5. This will occur in most cases within a year.

6. There is a 7 per cent chance that renal tuberculosis will develop after epididymectomy.

7. Satisfactory late results may be expected in more than 60 per cent of cases.

DISCUSSION.

Dr. H. W. E. Walther (New Orleans): I think that a tuberculous diathesis must be considered in all unusually prolonged instances of "gonorrheal" epididymitis. We still have a great deal of Neisserian infection to treat and we will always see a fair proportion of these cases develop epididymitis, a most painful and oftimes very distressing symptom to the patient, incapacitating, and sometimes very troublesome for the doctor to get any results. We have noticed in our practice that these so-called obstinate cases of gonococcal epididymitis, where there is no response to therapy, mostly occur in rather thin emaciated males and I cannot help but feel that where the Wasserman is negative and we can find no evidence of malignancy, that tuberculous diathesis must be considered. So along with the

usual treatment that we direct in these infections we should carry out the tuberculosis regime of rest, sunlight, or ultra-violet lamp, plenty of food and fresh air; in fact, the usual treatment employed in pulmonary tuberculosis. Foreign protein, therapy, used ordinarily and with somewhat good results, is rather to be condemned here for it seems to light up these conditions with tuberculous diathesis. Furthermore, with diathermy, which is employed a great deal in the treatment of epididymitis, we notice in this type we do not seem to get good results; on the contrary, it appears rather to aggravate the condition.

Ballenger of Atlanta, when he encounters hydrocele as an accompanying condition aspirates the hydrocele fluid and reinjects it in the buttocks, continuing the treatment, giving the injections every four or five days. He says tuberculous epididymitis responds miraculously to this treatment. Just what there is in the serum from hydrocele I do not know but he reported a series which is quite interesting.

Then we have Keyes' operation. He advises incising the epididymis from pole to pole, first, of course, suturing the tunica to the skin, opening the epididymis wide, curetting and leaving open. He says these tracts do not heal sometimes for a year. He has good results by that operation, but whether it will cure the infection time only will tell.

After tapping or puncturing a scrotal abscess we know that we often find fistulous tracts we feel are due to tuberculosis. Here ultra-violet light helps. When the seminal vesicle and prostate are involved, try ultra-violet. Keyes states that when French urologists encounter unilateral tuberculous epididymitis, they (due to their experience of past years in finding such a large percentage of recurrences on the other side) at the time of operation do a bilateral epididymectomy.

Dr. Abe Mattes, (New Orleans): I believe if we could voice the experience of the urologists throughout the world in regard to genital tuberculosis we would find there is quite a difference of opinion as to the treatment indicated in the cases encountered. In our colored service at Charity Hospital I can only remember one case in ten years that came back for epididymeal involvement in the remaining testicle. We see ordinarily about a half dozen cases of tuberculosis of the epididymis in our service during the year, quite a contrast to the high incidence of tuberculosis, pulmonary, renal and otherwise. The conservative measures, by which I mean curettage, excision of tract and, in more marked cases, orchidectomy, serve to remove the cause of disability. In the last few years I have seen several cases of seminal tuberculous secondary to renal tuberculosis, the condition making its appearance after the tuberculous kidney had been removed. Two cases in which the prostate and seminal vesicles became involved following nephrectomy for renal tuberculosis, much to my surprise, subsided under the ordinary treatment adopted for tuberculosis.

I certainly enjoyed Dr. Bumpus' very interesting paper.

Dr. H. W. E. Walther (New Orleans): I would like to ask a question. I am well aware that the Mayo Clinic believes quite widely now in biopsy work. Would it be contraindicated in tuberculosis where we have a lesion of which we are in doubt as to operating on the epididymis? Would that be one time when you would do a biopsy?

Dr. H. C. Bumpus (closing): In answer to Dr. Walther's question regarding biopsy, I believe that would depend on the acuteness of the disease. We had two patients who developed meningitis after operation had been carried out in a subacute case. There is evidently a greater chance of spreading the tuberculosis organism from a subacute epididymitis than is usually supposed.

I purposely left out anything in regard to the treatment of this condition because of the short space of time. When Dr. Young was in Rochester some years ago he spoke on this subject. He believes the entire seminal tract should be removed and stated that if the urologists would go back to their records they would find very few cured cases by conservative surgery after five years, so in making this study we left out all the cases that have been treated within the last five years, and we found 60 per cent of good results after that period. We tried Young's radical operation in nine cases; four died, four are living and one we have been unable to trace. Of the four we were able to get in touch with, three are in good condition and one has a discharging sinus. That certainly shows no better result than by the conservative method.

There is no doubt about the advantage of heliotherapy or ultra-violet light, but that requires a considerable expense. This treatment has been carried out on service men who were put to bed and kept there a year. There are very few patients we can confine to bed for such a length of time to give them the advantage of heliotherapy.

COMMON DISORDERS OF THE COLON OBSERVED IN THE TREATMENT OF THE CHRONIC INVALID*

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Disorders of the gastro-intestinal tract have received considerable comment by the profession during the past few years, but most of this attention has been centered on the upper part of the tract. Peptic ulcer, malignancy, and biliary tract troubles have largely monopolized the space in medical literature. The colon and its disorders have escaped the critical study warranted by the disability resulting to the individual thus afflicted. For some years, we turned the colon over to those who served the interests of the manufacturing chemists and they vied with one another in their efforts to provide new cathartic combinations. Little did we realize that we were placing a mortgage on the future comfort of our patients, a mortgage which many are paying today.

Recently, there has been a decided change in the trend of literature and we note that the lower gastro-intestinal tract is receiving its share of attention. We recognize that the individual complaining of marked symptoms indicative of functional misbehavior on the part of the colon, is not well and is entitled to legitimate study rather than a curt dismissal with a diagnosis of neurasthenia. I wish to discuss some of the troublesome conditions of the intestinal tract which we meet in institutional practice that are difficult to diagnose and where a satisfactory treatment can only be determined after careful observation and study. The term colitis is used somewhat loosely by the profession. Strictly speaking, it indicates an inflammation of the colon but it is used frequently to designate certain functional disturbances where the pathologist could not agree with the diagnosis. Discussing this subject, Hurst says:

> "No diagnosis is made more frequently and with less justification. Usually when colitis is diagnosed, a name indicating an organic disease is given to explain symptoms which are functional, and much time and money are spent on vaccines, intestinal douches and visits to spas, when nothing more than a little judicious psychotherapy is required. On the other hand, the same diagnosis is often made when cancer of the colon or rectum is really present, and weeks are allowed to pass with futile bacteriological and local treatment until all chances of cure by a radical operation are lost. It is clear, therefore, that colitis should never be diagnosed until a thorough investigation has shown that inflammation of the colon—nothing less and nothing more—is present."

We are all familiar with the acute colitis which is met with most frequently in children during the warm weather. It is due to some specific infection usually introduced with food which is undergoing decomposition, or it may be due to the development of certain types of bacteria, possibly normal inhabitants of the intestinal tract which have become pathological as the result of a lowered resistance on the part of the individual. These infections are usually exogenous and apparently attack the intestinal walls from contact with the intestinal contents. We are not particularly concerned with these today. We are more interested in the chronic forms of colitis, those types that may be due to infections blood borne or possibly to parasites introduced with food or drink.

A strictly typical colitis is the chronic ulcerative type, which may be conveniently classified, etiologically, into five groups: First, the tubercular form; second, those cases resulting from malignant growths; third, the amebic or bacillary type; fourth, those cases found in typhoid states, or pellagra, or as terminal findings in certain wasting diseases; fifth, the so-called nonspecific type. The first two types I shall not attempt to discuss. The third, or amebic type of ulcerative colitis, is seen in this section of the country very frequently. It was formerly considered to be limited to

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the Southern portion of the United States, but is now being reported from all sections of the country. The diagnosis is frequently being over-looked because of insufficient laboratory study or because of its peculiar clinical manifestations. The following case will illustrate this:

Case I. Early in 1926, I was called in consultation to see a patient who had been ill a few weeks. The clinical diagnosis of intestinal flu had been made early in the course of the illness. The patient had complained of abdominal pain, tenderness in the right upper quadrant, backache, and his temperature which was high early in the illness, was at this time 102.5° to 103° daily, with a pulse rate in the nineties. There had been no definite indications of diarrhea at any time in the history of the case to date. Because of a slight enlargement of the liver with some tenderness, it was at this time considered that the gallbladder might be involved and operation has been advised. I was unable to agree as to the necessity of operation and it was postponed. A couple of weeks later the patient came under my personal care. I studied the case for at least three weeks without arriving at a definite diagnosis. The temperature persisted, some days going as high as 104.5°. At no time did the patient exhibit a diarrhea though he did have two and some time three unformed bowel movements daily. Finally, in an examination of the warm stool, a few entameba histolytica were found, and it was decided to treat the case as a possible amebic infection. He was accordingly given emetin by hypodermic injection. The day following the first injection, the temperature dropped to 101.5° and after the second injection it became normal. After two weeks' treatment there was a slight rise in temperature and it was decided to resort to stovarsol by mouth. In three weeks the patient was discharged, with suggestions as to proper follow up treatment. He has been under observation at intervals up to the present, and has experienced three or four mild relapses with rectal or lower sigmoid ulceration, but at no time have we discovered the entameba histolytica, although careful examinations have been made. The treatment giving most satisfactory results in the later stages has been stovarsol by mouth and mercurochrome by rectal injection. In reporting an observation made recently, the proctologist reports a rectal lesion slightly suggestive of malignancy.

Whether this case was a peculiar type of amebic dysentery from the beginning, or whether the patient originally suffered from an influenzal attack, on which the amebic type of colitis was grafted later, is in my opinion difficult to determine. The promptness with which the symptoms yielded to the specific amebic treatment would warrant the belief that the infection was primarily one of amebic colitis. A further question as to whether the patient had been completely relieved of this infection is very pertinent, in view of a more or less frequent recurrence of rectal or lower colon ulceration with occasional attacks of diarrhea. We can all recall cases of amebic dysentery where the symptoms were severe and where there was a marked tendency to recurrences. I have a man under my care at the present time who has suffered from frequent attacks of diarrhea for twenty years. Proctoscopic examination showed numerous ulcers in the rectum, suggesting an amebic invasion of the mucosa, and laboratory examination revealed the presence of many active entameba histolytica. Many of these cases must be treated surgically in order to obtain relief. My observations would lead me to believe that the treatment of recent years—emetin, stovarsol, yatrin, etc.—has been a great improvement on former methods, and that surgery is demanded far less frequently. This subject has been exhaustively discussed by James and others, and I shall not attempt a thorough discussion of the therapy. It might be well to call attention to the fact that unfavorable results have been observed in a number of cases after the use of stovarsol. Because of its high arsenic content it is not well tolerated by some individuals; therefore, it is well to keep the patient under close observation and to be on the lookout for early arsenical effects.

I wish to discuss at greater length those cases formerly classified as chronic, nonspecific ulcerative colitis. Previously, they have been supposedly rather rare, but since the published works of Bargen, Logan and Buie it is a question if we have not been

over-looking a considerable number of them. Bargen reports:

"From January, 1924, to January, 1927, 385 cases of chronic ulcerative colitis were observed at the Mayo Clinic. In 266 of these the material obtained through the proctoscope was cultured according to the methods of Rosenow; a pneumococcus-like diplococcus of characteristic morphologic and biologic properties was isolated in 189 (71 per cent) of these. Such an organism was always found in the acute or sub-acute cases."

His work would tend to prove that we are dealing with a specific infection, and while his findings have not yet been generally accepted as to etiology, reports from others are being received from time to time which corroborate them. There is no doubt but that diplococcus with typical cultural properties may be obtained from the ulcers in these cases, but whether this is the specific cause or not, may not have been definitely proven. We see a great many different forms of colon disturbance in our clinic but we do not see, in proportion, nearly the number reported by Bargen and his associates. A definite diagnosis of non-specific ulcerative colitis is not made in our institution in more than fifteen or twenty cases per year.

I. The diagnosis of non-specific ulcerative colitis must be made with care in order to differentiate from the tubercular and amebic types, also from pellagra where we occasionally have ulcerations in the colon as a terminal finding. The most classical findings on which the diagnosis is based are the pin-point ulcers or miliary abscesses, in the lower sigmoid and upper rectum, found by sigmoidoscopic examination. These are observed in all cases where the disease is active, but since there is a marked tendency to remissions in the trouble, there may be times when they are absent and they also may be found when the patient is clinically well. Later on in the disease, the pin-point abscesses coalesce, forming large ulcers, more suggestive of the amebic type, as illustrated by Case III. reported later. Careful proctoscopic examination in ulcerative colitis is essential to a proper diagnosis. It is most unfortunate that the proctoscope is so neglected by the medical profession. It is used by the proctologist but the ordinary internist rarely feels that he is justified in resorting to this type of examination. This no doubt results in a great many cases being over-looked, which means especially in the malignant cases, that much valuable time has been lost and the patient's chances of surgical relief greatly lessened, and, moreover, in non-specific ulcerative colitis if the diagnosis is made early, before the colon has been badly damaged, the posssibility of complete cure is much greater than where the disease has become chronic.

II. The presence of pus, mucus and blood, both occult and microscopical, are constantly found in the stool during the active stages of the disease. At times a bowel movement will contain practically no fecal matter, the mucus, blood and pus constituting its entire bulk. Careful and repeated stool examinations are essential to a proper understanding of these cases, not solely on account of the microscopical findings, but also on account of the bacterial findings.

III. According to Bargen: "Recent investigations of the disease seem to have established the fact that it is due to infection of the colon by a specific causative organism * * * a gram-positive, lancet-shaped diplococcus of characteristic morphologic and biologic properties." We have corroborated these findings in a number of our cases. We may further say that we have also found this, or a similar organism, in rectal ulcers of a type not suggestive of the non-specific variety and we would wish to withhold our opinion as to this being the definite etiological factor. Brown states:

"As regards the bacteria found, we have not been able to incriminate any specific form from careful cultural studies made from stool, from mucosal scrapings, or from material obtained directly from the appendicostomy or cecostomy discharges—the picture was protean—in many cases

organisms not differing from those usually found. In one case the bacillus Welchii strongly predominated, both in rectal and appendicostomy specimens; in another case, a streptoccoccus with diplococcal arrangement. In one case a Gram-positive anaerobic diplococcus also obtained in almost pure culture from the appendix when opened for an appendicostomy."

Hurst believes that the cases which he has observed are more likely to result from an infection of the bacillus dysentericus.

IV. The history of the case is very valuable in establishing a diagnosis, as the physician may be consulted at a time when it is impossible to definitely arrive at a proper diagnosis from the physical findings. If the case is a chronic one the patient will report periods of great prostration with marked diarrhea, blood, pus, and mucus in the stools, and a definite anemia of a secondary type. The ulcerations at times heal very rapidly only to recur at a later time with definite appearance.

V. The roentgen-ray findings are supposedly of assistance in arriving at a proper diagnosis, especially when the site of involvement is above the rectum and sigmoid. Some radiologist report a peculiar mottled appearance which they believe to be indicative of ulcerations, but probably the more definite findings are such as are found in the severe forms of colitis or other types, such as spasticity, strictures, adhesions, disappearance of haustral markings, the appearance of the affected parts suggesting a smooth inelastic tube.

I should like to report the following cases which quite definitely indicate some problems both in diagnosis and in treatment:

Case II. LFR, female, aged 27 years, came under observation in November, 1927, giving a history of bloody stools with a rapid decline in health for the past six months. Careful interrogation revealed that she had not been well for three years. She first began to have attacks of diarrhea in 1925, and had on several occasions noted blood in the stools, but the more severe symptoms dated back only six months. In 1926 she spent some time under the care of Doctor Bargen, who at that time made a diagnosis of ulcerative colitis and began the use of his vaccine, which she used according to instructions for several months. She was a school teacher and was greatly inconvenienced in her work because of diarrhea during the spring of 1927. At this time she was having from twelve to fifteen stools daily. The stools were not copious, sometimes apparently nothing but a little blood and mucus. In June (1927) she was taken to a hospital in Des Moines. On July 4, while in the hospital, she became acutely ill with symptoms resembling cerebral embolus. Following this, she was in a semiconscious state for ten days, and for some four or five months experienced a marked weakness in the left arm and leg.

On admission to our institution four months later, she was confined to her bed, weighed about one hundred pounds, and complained of great weakness, loss of appetite, and was having ten to fifteen stools daily. Examination of the stools revealed blood, pus and mucus. The sigmoid examination revealed a pale rectal mucosa studded with pin-point ulcers or abscesses, with an occasional large ulcer which bled readily. Bacteriological examination revealed the diplococcus was characteristics similar to those described by Bargen. The blood examination gave a red cell count of 3,270,000, white cells 9,000, with a hemoglobin (Dare) of 50. The treatment instituted and followed with slight deviation was as follows:

The use of Bargan's vaccine beginning with .2 c.c. each week and increasing up to 2 c.c. The patient received one cleansing alkaline enema daily at a temperature of 110° and a rectal injection of a one per cent mercurochrome solution was used daily for some time. With the healing of the ulcers and disappearance of the blood, this was discontinued. Later, due to a re-appearance of the blood, acriflavin has been used. Recently, we have used stovarsol in small doses—one grain daily—as on a previous occasion she had responded unfavorably to larger dosage. She apparently improved during the time this was being used, though it is not supposedly to particular value in this type of trouble.

During the entire time of treatment, the patient had complained of abdominal tenderness, but the exact location of this has not been definitely determined. She was given fomentations to the abdomen twice daily, and a cool rub following. Her diet has been liberal, bland in character, and as rich in vitamins as possible. She is still under observation; has gained forty pounds in weight and there has been a decided improvement in the anemia.

Some of the peculiarities of this case are a tendency to pass a stool in the morning that may be formed. Later in the day, an intense flatulency obtains and by evening she is apt to pass one or two decidedly liquid stools. She may exhibit a temperature of 99.6°-99.8° each evening, six months after beginning treatment. She still complains of a sense of abdominal soreness which we are unable to locate by physical examination. She is particularly conscious of this when standing. These persistent symptoms after such painstaking treatment warrant our being careful as to our prognosis. This case illustrates the chronicity of the disease, the typical anemia and the characteristic stools. Further, the injury to the nervous system has not been satisfactorily explained.

Case III. HHW, male, aged 21 years, came under observation in May, 1922, giving a history of typhoid fever in November, 1921, following which he had not been able to leave his bed. In the fifth week of fever he had hemorrhages from the bowels which persisted for five days. Following the hemorrhages, he passed blood and mucus and slimy stools, with pain and cramping in the left abdomen coming on about a half hour after meals. At the time he presented himself for treatment he was having watery stools, averaging six per day, tinged with blood and considerable mucus. There was nausea but no vomiting; weak and emaciated. Entameba histolytica were found in the stools.

Medication: Irrigations of quinine solution—ten grains of quinine sulphate to the quart of water—temperature reduced to ice cold. Also quinine hydrobromide, ergotine, tannalbin and bismuth carbonate by mouth.

Diet: Bland, non-irritating, eliminating all seeds and hulls.

At the end of the first week he had gained four pounds in weight. At the end of the second week he was taking 3000 calories per day, had gained eight pounds and no ameba were found in the stools. He remained under observation until October 12, 1922. He had gained 56½ pounds in weight and stated that he never felt better in his life. Stools were quite normal.

Came under observation again in April, 1924, at which time the ameba were again found. He was given emetin, and quinine enemas. Recovery was satisfactory—gained some 25 or 30 pounds and was feeling quite well.

Returned again in September, 1927. Had lost 43½ pounds in weight. Complained of severe diarrhea with blood and mucous in the stools. Examinations of the stools on this occasion had not shown the presence of the entameba, but he was treated on the suppostion that he might have the entameba bcause of prvious experiences. He was given stovarsol and medicated enemas with only temporary benefit. A few weeks later he ceased to gain weight and there was more blood in the stools. He had a daily afternoon rise of temperature, often going as high as 102°.

Since he did not improve on medical treatment, it was decided that he should have surgery, and an ileostomy was done on March 7. He had not been under surgical observation for sufficient time to determine what the results will be. His temperature has been normal for the past week.

Case III. Mrs. R, aged 40 years, came to us stating that some five years ago her condition was diagnosed as ulcerative colitis and that she was under treatment in a sanitarium for six months, during which time the treatment was: Rectal dilatations with local medication, the character of which she had no information; emtin and other drugs; bismuth by enema. She was having as high as seventeen movements a day at that time. After six months, without relief of her symptoms, greatly reduced in weight and markedly anemic, she returned to her home, and one the advice of a neighbor resorted to the use of sulphur and molasses. Relief of the frequent evacuations was almost immediate; she gradually regained her weight and was well for one and one-half years.

At this time she stated that she ate some popcorn which caused a recurrence of her old trouble and on attempting to obtain relief, resorted again to the sulphur and molasses, but found that it did not have the desired effect. Someone suggested soda, which she took for a time, and again obtained relief. Following this, she was free from trouble for one year when there was a recurrence of her symptoms, from which at the present time she had not obtained complete relief.

For the past three or four months she had been passing mucus with a little blood. Several weeks ago she had a series of convulsions—fourteen in three days—the trouble beginning in the fingers of the left hand and extending up into the face and down the left side of the body. She stated that she was not unconscious. The convulsions lasted from five to eight minutes. The physician who saw her sugested that the trouble was probably due to a cerebral embolus. She was in bed two weeks—very nervous and hysterical.

Patient did not remain under observation. Was given an outline for home treatment. We are not sure that the convulsive moments may not have been of hysterical origin in this case.

This case also illustrates very definitely the chronicity of the disease and the tendency to remissions which are present in most of these cases. The peculiar household remedies probably had no effect on the disease but were used at the time of remissions and accordingly given the credit for relieving the trouble. This case also reports a neurological complication which has not been satisfactorily explained.

Case IV. H. A. S., male, aged 37 years. The patient came to my office to consult me relative to an intestinal disturbance which had annoyed him for the past two or three years. He stated that he would have from fifteen to twenty bowel movements per day, passing much mucus and blood. The protoscopic examination in this case revealed many small pin-point ulcers with occasional ulcers of elliptical shape, approximately 3 to 8 m.m. in their long diameter, very suggestive of the amebic infection. Bacteriological examination of scrapings from the ulcers showed the entameba histolytica and was positive for Bargen's diplococcus.

This patient did not remain under our observation but was referred to Dr. Clement Martin of Chicago, who reported on January 3, 1928. "A five-day course of stovarsol was started December 10, and the result was satisfactory. A second course was given December 21 to 25. On proctoscopic examination December 15 many of the ulcers were seen to have healed and the others were healing. Today all the ulcers are healed. The clinical improvement has been good, the diarrhea controlled and the abdominal distress relieved. There was no unfavorable arsenic reaction."

This case illustrates the possibility of the patient suffering from both the entameba histolytica and also exhibiting the diplococcus of Bargen with the typical pin-point ulcers. Bargen calls attention to the fact that parasites were present in the stools in 11 per cent of their cases, the entameba histolytica being fround in ten cases. This case would justify the use of a parasiticide in addition to the treatment for ulcerative colitis.

From a study of these cases, one is impressed with: First, the chronicity of the disease. A period of four years is not an unusually long time for the disease to persist. It may go on for ten or fifteen years and the patient finally succumb to some intercurrent trouble. Second, the tendency to remissions. In practically all of the cases which we have reported, there have been remissions, and since this is no typical of the disease, we would be very cautious in concluding that the patient is cured. Such a statement is justified only after a period of three or four years of reasonably normal health. Third, the possibility of a specific type, such as the infection of the entameba histolytica finally developing into the non-specific type. The prognosis in these cases has not been particularly favorable.

Our time will not permit of a detailed review of all the measures that have been proposed for the treatment of this condition. Bargen's conclusions relative to treatment are as follows: "The treatment of chronic ulcerative colitis now in use which affords the best results is immunization against the causative organism, removal of foci of infection, plenty of nourishing food, mental hygiene, and such supportive measures as are indicated in individual instances." Hurst, in a discussion of this disease, advocates, on the grounds that the disease is really an aborant form of bacillary dysentery, large doses of a polyvalent antidysenteric serum intravenously. Whether either of these treatments may be regarded as specific only time will tell.

I am of the opinion that, in outlining a therapy for the cases which come to us, one of the most important factors is complete rest in bed. In our routine the patient is kept in bed until the rectal ulcers are healed, or at least until the blood disappears from the stools. We further believe that local applications are beneficial in producing prompt healing of the ulcers. Mercurochrome in 1 per cent solution, or acriflavin 1-5000, have been used in all our cases with apparent benefit. In severe forms of dysentery tannic acid in some form is prescribed either by enema or by mouth, for its astringent effects. In certain cases we have felt that irrigation of the bowels with an alkaline solution was quieting to the excessive peristalsis and

had a beneficial effect. Bargen feels that such measures are of very limited value. Opiates we rarely use, although the dysentery may be so severe at times as to demand them.

Our cases have all been given a liberal but very bland diet. Milk has been an important part of the diet but cereal gruels and purees of vegetables are also allowed. When the diarrhea has subsided the use of orange and tomato juice is especially beneficial. We believe a diet rich in vitamins is essential. In a recent article, Larrimore calls attention to the necessity of such diet in the treatment of these cases, and is of the opinion that a certain vitamin deficiency over a long period of time may have been a factor in the patient's emaciated condition. Because of the pronounced secondary anemia every effort possible is made towards correcting this. We have not had to resort to transfusion, but in the event of severe anemia, we would recommendation its use.

Careful consideration is given to possible foci of infection. Bargen and his associates are of the opinion that the trouble originates usually from a focus in the upper respiratory tract—tonsils or teeth—and strongly recommend that careful search be made in every case for a focus of infection. He reports that in a series of 200 cases, tonsillectomy was performed in 109 and teeth were extracted in 120. We are also of the opinion that it is advantageous to use the vaccine as provided by Bargen. We have not observed such striking results as he reports but have seen no ill effects from its use and are more than willing to persist in our efforts with it, hoping that the course of the disease may be shortened and the relapses avoided.

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DISCUSSION.

Dr. F. M. Johns (New Orleans): I was very much interested in Dr. Eggleston's paper, because, from a laboratory standpoint, we are so frequently called upon to diagnose these cases. We usually fight them for a few days, and send them back with the diagnosis "colitis." It is highly interesting to me to notice with what degree of rapidity the average case of ulcerated colitis will clear up after being properly diagnosed and proper treatment instituted, for within a few weeks we get a complete regeneration of the colonic mucosa. I really believe that most of these represent the effect upon rather than a disease situated within th mucosa itself.

I remember a famous case that was cured almost miraculously. This was in a doctor's wife. I think nearly all our gastrologists saw her, with the exception of our chairman. We followed her for a number of years, and found she was sensitive to milk. As soon as she stopped taking milk she got entirely well.

Most of the cases we find may be resolved into secondary lesions from such conditions as pernicious anemia, where we have a residue of undigested meat which putrifies and the split-protein products affect the mucosa. Another very frequent cause has been found to be disverticuli or benign polypi of the colon. Those cases where surgical intervention has been possible have rapidly cleared. I believe a study of the anatomical structure together with the food residuals is one of the most important conditions in the proper diagnosis of such conditions.

With regard to ameobic infections, I think we are becoming more and more impressed with the necessity of all the modern methods of diagnosis. For instance, the search for cysts in between the stages in which you can get the acute vegetative forms is of the utmost importance. Some of the methods of concentration frequently will reveal them where a direct smear examination will fail.

Dr. Chaille Jamison (New Orleans): I was very deeply interested, naturally, in what Dr. Eggleston had to say. I want to emphasize, particularly, the remarks he made about the use of the proctoscope and its very great importance. It is a very simple instrument, one that should be in the hands of every interne. In my service, which is a general medical service of course, we have to deal with a great many dysenteries and diarrheas and we have made it a routine practice in such cases to use not only the protoscope but also the sigmoidoscope.

We feel that in any of these cases, even with a history of diarrhea or dysentery, a routine examination should be made particularly for the existence of amoebae. When ulcerations are found, whether they are the frank ulcerations, or merely pin point ulcerations and small abscesses, one disease must always be considered, the one that I see frequently (because my service is a negro service), and that is syphilis. It is remarkable how some of these cases we feel we can almost make a diagnosis from the outer appearance alone, provided amoebae can be excluded; and it is remarkable how many cases will clear up with anti-syphilitic treatment. I think that has something to do with the nonsyphilitic specific cases clearing up under salvarsan. It was first brought out for the treatment of syphilis, and that is one disease that should never overlook even if the Wasserman is a negative.

The second disease that we also consider, particularly when we have a dysentery or diarrhea, without any particularly amount of blood or mucus, but with fairly voluminous stools with an amoebae and with great chronicity is sprue. Sprue usually presents the typical picture of pernicious anemia; not always, however. I think that sprue, gentlemen, is very much more common in our Louisiana than most of us are ready to believe. I am frank to admit that I cannot differentiate sprue with any certainty from pernicious anemia. In such cases, this type of voluminous diarrhea and anemia, I have found had what I consider brilliant results by the use of liver extracts. I am very much interested in what Dr. Egglestone had to say, and I thank him very much for his mention of salvarsan.

Dr. E. V. Trahan (Baton Rouge): I would like to ask one question of Dr. Eggleston, and it is a question of intestinal mycosis, whether he noted this, and associated it in anyway with these ulcers? The subject of sprue, mentioned by the doctor, brought to my mind this question. Of course, we do not know, as it has never been proven that sprue has anything to do with intestinal mycosis, but in the past the two have been associated, and we have a good many cases of these ulcers in which we found considerable intestinal mycosis, much more than normally found, and we were inclined to believe it had something to do with the trouble. I would like to know if Dr. Eggleston did any work along this line?

Dr. D. N. Silverman (New Orleans): Any further discussion? I regret to have to take up any time, but I am not altogether in accord with some of the statements that have been made. I do not think that amoebic dysentery is a surgical condition; that is not only my own opinion, but that is the opinion of men who believe they have been able to treat the disease medically. Chronic bacillary dysentery is often a point of contention, and many men do not believe there is such a thing. However, there are authorities, such as Russell and Rogers, who believe that the ulcerated condition, started by the acute bacillary dysentery persists as a chronic condition and is truly a chronic bacillary dysentery, rather than going into a secondary infection and giving us a chronic ulcerated colitis, so called.

I asked Dr. Baldwin about this while in Rochester, and he said that there was no history in the cases he had reported in chronic ulcerated colitis, or any investigation to determine whether these patients had previously had bacillary dysentery or any of its manifestations. However, I rise to say that I do not believe there is such a thing as chronic bacillary dysentery, caused by the bacilli of Frankland and of Shield; and as reported by Simon Flexner, himself, some of these cases are benefitted not only in the acute stage, less often in the chronic stage by the use of the anti-dysentery serum, both the polyserum and sheep serum for the shiba type. If there is no further discussion, I will call upon Dr. Eggleston to close.

Dr. E. L. Eggleston (closing): I appreciate very much the discussion which my paper has provoked. Relative to the intestinal mycosis, we have done very little work along this line, so I am unable to answer the question of Dr. Trahan.

The skin tests for food allergy are very essential and should be made far more frequently than has been done in the past. As pointed out by Doctor Johns in his case, the sole trouble was apparently due to sensitization to milk on the part of the patient.

Relative to Dr. Silverman's remarks on surgery: I agree with him that surgery ought not to be used except in extreme cases; nevertheless, there are times when a cecostomy or iliostomy may be necessary in order to save a person's life.

The mortality in the non-specific type of ulcerative colitis is rather high. It has been reported as high as 25 per cent. We do not observe our patients for sufficient length of time to arrive at a satisfactory conclusion relative to the mortality in this group of cases. Our patients, as a rule, make definite improvements. The period of time necessary to accomplish this is indefinite; it may be as short as one month or it may be a period of six months. When the patient leaves us in apparently good health, we are not satisfied that a recurrence may not be possible. The use of the term "cured" in these cases must be with definite reservations. The tendency to recurrence in the

apparently cured patients warrants the belief that the illness may persist for years with periods of absolute freedom from symptoms. The theory of some investigators that the non-specific type of ulcerative colitis is due to a definite infection, is clinically borne out by these observations.

The necessity for studying these patients with great care before surgery is recommended reminds me of an incident related by Dr. Julius Bauer recently. He stated that in one of these Western citis a case was brought to his attention that had been operated sixteen different times without apparent improvement in the patient's condition. It is true that not all the operations were on the gastro-intestinal tract, but it was his opinion that if we had more good internists and fewer speicalists that the patient might have been spared many of these operations.

Draper, Cotton and associates, believe that in many of these cases a colectomy is advisable. We appreciate that the condition is a most troublesome one, but have not been convinced that surgery provides a great amount of relief. Their opinion, nevertheless, would warrant a very respectful consideration of the problem.

TRAINING HEALTH WORKERS.*

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INDIANOLA, MISS.

For the past ten months the Indianola Training Station has provided practical field experience for prospective county health workers in the flooded area. The Mississippi flood of 1927, besides economically crippling a population of three-quarters of a million by the loss of buildings, livestock and crops, was looked upon as the forerunner of conditions which menaced the health of the affected population. The Red Cross, the United States Public Health Service, State Health Departments and local physicians rendered valiant service in handling the immediate situation of medical and sanitary relief. The account of their efforts in immunizing the refugees against typhoid fever and smallpox, in protecting water supplies and ameliorating insanitary methods of excreta disposal has been ably recounted by others. Dr. F. J. Underwood, your state health officer, and Dr. William DeKleine, of the Red Cross, have shown in recent reports that the incidence of typhoid fever and smallpox in the flooded area was less in 1927 than in previous years. No one will ever know what might have happened if precautionary measures had not been taken. We insure against the loss of life and property and if no great damage is experienced we do not question the wisdom of having paid the premium.

The farsighted leaders of our Federal, State, and voluntary health agencies saw the need for permanent health organizations to continue safeguarding the health of the residents of the overflowed area. It was expected that the menace of malaria, pellagra, typhoid and other intestinal diseases, as well as the many problems of maternal, infant and child hygiene would be accentuated for some time by the economic stress following the overflow. Further, it may be admitted that the attention focused on public health by the flood was capitalized for the worthy purpose of extending health service to rural communities. The county health department has proven to be the logical unit for rendering health service to our rural population. For many years urban centers have been the only ones to profit by the application of methods of preventive medicine to the public at large. The first county health departments in the United States were established as recently as 1914. Since approximately 50 percent of the population of the United States is rural—that is, living in communities of less than 2500 inhabitants—it is readily apparent that more than half of our population has had no local full-time health departments until late years. In 1923 there were 214 full-time county health departments in 26 states

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of the Union. Up to the period of the recent flood there were about 350 full-time health units organized on a county basis.

That the flood had a compensating constructive feature as well as a destructive side is attested by the fact that 86 counties in the seven flooded states of Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri and Tennessee have established full-time health departments since the overflow. There were 100 counties inundated, and of these, 86 have adopted budgets for county health departments, assuring local full-time health service to almost all of the overflowed counties. This increment of 86 county units to the existing 350 county units has materially increased the percentage of our rural population receiving full-time health service. It can be safely stated, in fact, that the flooded area is now more adequately served by full-time health service than the rest of the rural United States.

The distribution of these health units organized in the flooded states since the overflow is as follows:

States	No. of Counties Affected by Flood	County Health Budgets Adopted
Arkansas	24	20
Illinois	3	1
Kentucky	24	24
Louisiana	31	24
Mississippi	9	9
Missouri	6	5
Tennessee	3	3
	100	86

The raising of funds for these units was a big undertaking which has been successfully accomplished The first flood area units were organized in July, 1927, while others have been subsequently established. For the 18 months or fractional part of that period, that is, to December 31, 1928, for which the budgets has been assured, the total expenditure of the various contributing agencies to these 86 county health departments will total one and a quarter million dollars. That is a business-like amount which impresses one with the need for safeguarding the investment by all possible means. To that sum the counties are contributing approximately 20 per cent, the respective state health departments of the 7 states are contributing 20 per cent, the Federal Public Health Service will contribute 36 per cent, while the Rockefeller Foundation adds 24 per cent. Because most of these counties were called upon to make an appropriation for health work at a time when they were economically hard pressed, it has been necessary for the outside agencies to contribute a larger percentage than is customary in the usual co-operative budget of a county health department.

The personnel of a standard county health department includes a health officer, one or more public health nurses, one or more sanitary inspectors, and a clerk or secretary. Of all the factors leading to the success or failure of these new units, the selection and training of the necessary personnel has been recognized as the most difficult task. The work to be accomplished during the first year or 18 months rests largely on the shoulders of the four staff members of the unit. The reception which their work is accorded by the public and the co-operation which they receive in improving health conditions reflect in a large measure their own qualifications and accomplishments. The stability of the unit, its chance for permanence and the further appropriation of funds depend again, in no small degree, on the personnal of the unit. Providing qualified health officers, public health nurses, and sanitary inspectors for these rapidly created health units was another emergency which had to be met. Because of previous experience in this field, the International Health Division of the Rockefeller Foundation undertook the task of assisting in the training of these health workers. In July, 1927, the Field Training Station for Flood Area Personnel was established at Indianola, Sunflower county, Mississippi. An essential feature of the training station is that it is conducted in

conjunction with a standard county health department which carries on a normal, well balanced health program in a rural area. The training is primarily field experience, and the physicians, nurses and inspectors in training take part in the regular activities of their respective branches under the supervision of the county staff. The director of the training station is the county health officer, the nurse in charge of training is the county nurse, while the inspector supervising the training of inspectors is the county sanitary inspector. In addition, the station has a nurse who devotes most of her time to prenatal and infant home visiting and a third nurse who limits her activities to tuberculosis work. Recently we have obtained the services of a competent health officer to serve as assistant county health officer in order that the director of the station may devote more of his time to the administrative duties connected with the training activities. The general plan of training is patterned on that of the first field training station established by the Foundation at Andalusia, Alabama, under the direction of Dr. W. G. Smillie, and later in charge of Dr. Chas. N. Leach, who was also responsible for the organization of the Indianola Station. The Alabama Station trained only health officers. It is believed that the training at Indianola is the first endeavor to provide field experience to prospective county health nurses and sanitary inspectors.

In the 10 months up to May 1st, 1928, 234 prospective health workers have registered at the Indianola Station. This number includes 58 doctors, 84 nurses, and 92 inspectors, distributed by states as follows:

	Physicians	Nurses	Inspectors	Total
Arkansas	20	23	18	61
Kentucky	10	29	16	55
Louisiana	14	9	24	47
Mississippi	5	21	25	51
Missouri	0	0	7	7
Others	9	2	2	13
	58	84	92	234

The selection of the personnel to be trained has rested entirely with the state health officers and the directors of county health work in the respective states. It is interesting to review some of the qualifications of those coming to the station. A summary of some pertinent data is presented for each group of trainees:

Physicians:

Total number trained	58
No. over 40 years of age	29
No. under 40 years of age	29
Premedical education:	
High school only	20
1-2 years premedical college	27
4 years premedical and collegiate degree	11
Previous training or experience in public health:	
Little	19
Considerable	5
Estimated as good prospects	23
Estimated as fair prospects	25
Estimated as poor prospects or failures	10

	Nurses	Inspectors
Total number trained	84	92
Education:		
Less than high school graduates	31	18
High school graduates	36	25
1-2 years college, normal school, or business training	14	36
College graduates	3	13
Previous training or experience in public health:		
Little	18	11
Considerable	10	7
Estimated as good prospects	36	33
Estimated as fair prospects	33	39
Estimated as poor prospects or failures	15	20

The periods of training have varied from a minimum of 10 days to a maximum of 40 days. The average has been from four to five weeks. At the completion of the training period a report is made to the state health officer of the state to which the trainee returns to guide him in his decisions regarding the employment and assignment of the prospective health worker. Some comments may be offered on the above tables. Exactly half of the physicians trained have been over 40 years of age.

This group represents an era in which the teaching of preventive medicine in medical schools and the application of preventive measures in general medical practice have been, in the majority of cases, entirely foreign to their experience. After observing the mental and physical reactions of this large group it may be said that, as a rule, to which there are notable exceptions, a physician over 40 years of age entering public health work for the first time is a poor prospect. Passing judgment most leniently, only 40 per cent of the whole group were estimated as good prospects for county health officers. Eighteen of the group of 58 were the only ones having any experience or training whatever in public health work. It should be an aphorism that a medical degree, *per se*, is not a passport to a position in the field of public health. The recent medical graduate, at least in the better medical schools, so well exemplified at Vanderbilt where your former state health officer, Dr. W. S. Leathers, is so admirably inculcating the ideas of preventive medicine into the medical school curriculum, has some concept of public health and the prevention as well as the cure of disease. After observing the men going into health work in the flooded states, however, one may remark that the medical graduates of recent years have not yet, to any great extent, filtered into the field of public health. Progress is being made, but the large number of middle-aged practitioners of medicine being made into health officers is disappointing.

Among the group of nurses and sanitary inspectors trained at Indianola, it is notable that the inspectors as a group have had better preliminary education than the nurses. The large number of graduate nurses in the states bordering the Mississippi who did not complete high school previous to their nurse's training is regrettable and should stimulate the nurses' training school to attain higher standards for their entrance requirements. A public health nurse with insufficient educational background is under even a greater handicap than a private duty nurse. Her need of initiative, ability to handle responsibilities, and her public contacts require a greater capacity to think, for which basic education is fundamental. An encouraging feature in the development of rural sanitation is that a desirable type of young man is being attracted to the position of sanitary inspector. Thirty-nine (39) of the group of 92 have had some college training and 13 of them hold collegiate degrees. If any justification of the training station is needed it may be seen in the number of physicians, nurses and inspectors who, after a training period of four or five weeks, were appraised as poor prospects.

The training station provides no fixed curriculum or duties for the trainees. After a few days' observation, the trainees assist in the routine functions of the health department under the supervision of a staff member. After two or three weeks at the station, they are given some responsibilities or some individual problem upon which to work. To give an idea of the scope of the experience offered at Indianola, the following table lists the activities of the Sunflower County Health Department for the past 10 months:

MEDICAL AND NURSING DIVISION:

Cases of communicable diseases investigated	166
Home visits (tuberculosis, prenatal, infant, preschool, school, midwives, and others)	1783
Midwife club meetings	62
Number attending	708
Prenatal clinics	8
Number expectant mothers examined	195
Preschool conferences	17
Number preschool children examined	445
School visits	311
Medical examinations of school children	5317
School children found defective	3544
Nutrition classes	3
Children reweighed in nutrition classes	1791
Home Nursing & Hygiene Classes for girls	7
Number attending	187
Health talks	285
Schick tests	406
Diphtheria toxin-antitoxin (doses)	4955
Typhoid immunizations (doses)	7766
Smallpox vaccinations	5562

Laboratory examinations:	
County	503
State	2067
Births reported	855
Deaths reported	482
DIVISION OF SANITATION:	
Sanitary inspections	4672
Privies constructed and approved	1066
Septic tanks constructed and approved	27
Sanitary surveys and maps drawn	26
Restaurant inspections	174
Dairy inspections	39
Examinations of water supplies	23
Sewer connections obtained	17

Each day begins with a 15 to 20 minute office conference for members of the staff, at which all the trainees are present. The staff members and trainees report on the activities of the previous day and assignments for the day are made. In this way each physician, nurse, and inspector has the opportunity to see the department functioning as an integral unit; the inspector in training gets an inkling, at least, of what a public health nurse does. Since the control of communicable diseases is the cornerstone of public health work, the prospective health officers are taught the health officers' relation to infectious diseases. The county health officer visits each case of diphtheria, scarlet fever, typhoid fever, and smallpox reported, and the physicians in training accompany him, observing the investigative, quarantine, and instructional features of the case. It is hoped that the prospective health officer has his instincts awakened to the point of thinking in terms of (1) is it, or is it not the disease in question, (2) what is the source of the infection, if possible to determine, (3) are the rules for the isolation of the patient and the quarantine of contacts understood by those concerned, and (4) does the family know the public health precautions to be taken? Doctors in training may be sent alone on subsequent visits or to obtain cultures. The nurses visit communicable disease cases as occasion permits and as the need for the service demands.

From one to two weeks are spent by the student nurses with the regular staff nurses in making home visits to cases of tuberculosis, to expectant mothers, and to infants, preschool and school children whose families are to be investigated and advised. Usually two nurses accompany the staff nurse while only one trainee at a time makes the visit with the county nurse. The technique of a public health nursing visit is demonstrated by the routine activities of our nurses. Our record on all these cases are accessible to the trainees and spot maps of communicable diseases, tuberculosis, and prenatal activities are before them daily. Because 60 per cent of the births in Sunflower county are delivered by midwives, the instruction and supervision of county midwives is another function of our nursing service. District club meetings of midwives are held each Saturday, to which the nurses are assigned for observation, and toward the end of their training they are given the responsibility of conducting a meeting and of giving a talk. On every third week a prenatal clinic is held at the health department and 130 cases are now on our prenatal register. At each clinic between 20 and 30 cases are seen. On new cases a routine history, Wassermann, blood pressure determination, urinalysis, physical examination, and pelvic measurements are made. Old cases are examined for blood pressure readings, urinalysis, general condition and special symptoms. The doctors and nurses in training take part in at least one clinic; the doctors conduct the examinations, while the nurses take histories, obtain specimens, and assist the doctors. These prenatal cases are followed by nursing home visits as prenatal cases, and later as post partum and infant cases.

Our pre school work is emphasized more during the summer months, and the doctors and nurses present during that period take part in the organization and conduct of these conferences. School examinations form a large part of the winter program,

and the doctors and nurses in training are kept busy under the guidance of staff members. Nurses take histories, weigh and measure the children and keep records while the doctors make the inspections or examinations. The keeping of the school record file and the reporting of defects to parents and teachers are stressed in the nurse's training, and each nurse is given some responsibility in record keeping. In our immunization work against diphtheria, typhoid, and smallpox, which has its waves of popularity depending on season and on incidence of the respective diseases, the trainees are again mustered into service and the majority of them grasp the significance of dealing with preventable diseases from a community standpoint. It is true that the assistance rendered by the trainees contributes to the volume of health work accomplished in Sunflower County. As yet little has been said about the administrative details of managing a group of trainees, which compares with driving a sixteen-horse team and frequently threatens the staff members with nightmares.

Since the overflowed area, for which prospective health workers are trained at Indianola, is a region where intestinal or filth borne diseases still take a heavy toll, the sanitary inspectors spend at least 60 per cent of their time during training in the observation and practice of rural sanitation. Each trainee usually assists in the construction and installation of a septic tank, and the inspector who can't build and install, unaided, at least two type of sanitary pit privies doesn't "graduate." The inspectors are also taught the method of taking water and milk samples; they observe the inspection and grading of restaurants and dairies. Since the passage of the standard milk ordinance in Indianola we have two grade A dairies for demonstration purposes. One of these dairies was planned and its construction supervised by our sanitary inspector; parts of it were constructed by the inspectors in training at that time. To further supplement this field experience in dairy work, Pine Bluff, Arkansas, has recently been utilized for more extensive dairy experience.

During their period at Indianola most of the inspectors have taken part in mapping and making a sanitary survey of some town or plantation. The doctors have also assisted in these sanitary surveys. Toward the end of the training period most of the future county health officers have been assigned either singly or in pairs to some particular problem to study and on which to make a written report. A number of them have made a health survey of some town in the county. These reports usually total six or eight typewritten pages and deal briefly but in a unified manner with the water supply, sewage disposal, milk, housing, school, and communicable disease conditions in the particular town. Others have made house to house surveys of one or more plantations with respect to the past history of typhoid fever, and the type and condition of privies in use. Spot maps were prepared and stool and urine examinations for the detection of typhoid carriers were included in the reports by the student health officers. These reports have been used as the basis of sanitation programs inaugurated on some of these plantations. Others have made special pellagra or malaria surveys in particular areas.

Most of the doctors and inspectors, at least those destined for service in areas where malaria is endemic, have spent some of their training period in the adjoining county of Humphreys. Under the tutelage of Dr. P. S. Carley, county health officer, 40 doctors and 68 inspectors have averaged three or four days each during the past ten months getting an introduction to the subject of malaria. The doctors and inspectors have made field sketch maps, have caught and differentiated the species of adult mosquitoes, have dipped and differentiated the species of larvae, and the doctors have assisted in making history, blood and

spleen surveys to determine the local incidence of malaria.

Although no didactic program is scheduled and the training station is primarily field experience, occasional evening lectures or conferences are held for the benefit of the trainees. In the ten months 70 lectures, or seven lectures per month, have been held. The subjects of Pellagra, Malaria, Venereal Diseases, Public Health Administration, Communicable Diseases, Dairies, Reports and Record Keeping, Rural Sanitation, Maternity and Infant Welfare, Tuberculosis, Typhoid Fever, Trachoma, Home Visiting, Immunization Work, Mouth Hygiene, Water Supplies and Sewage Disposal are among the subjects which have been discussed by the staff and the health officials who have visited the station.

Incidental details in connection with the administration of the training station may only be mentioned. Each worker in training keeps a dairy, making brief notes as to each day's work in order that a review of his experience may be had at any time by the staff and his assignments varied according to his particular need. A small library containing a few reference books on public health, a moderate supply of medical, public health and nursing periodicals, and a collection of reprints are available for the use of the trainees. Seven touring cars, in addition to the cars of the staff, are at the disposal of the trainees for official use in their field work.

The Sunflower County Health Department has operated on an annual budget of $12,500. The salaries and travel of four staff members are paid from this sum; all health activities such as immunization work and the purchase of supplies and equipment for the county are financed by this budget or from local sources. For the training station a separate budget is provided by the Rockefeller Foundation, from which the largest part of the disbursements have been for stipends or living allowances to the prospective health workers while in training and for their travel expense. The doctors accepted for training receive $5 per day and the nurses and inspectors $3 per day; actual travel expense from the trainee's home to Indianola and return to the point of assignment is also paid. The expenditures by the training station in its ten months of existence total $46,924, which includes all stipends and travel, purchase and maintenance of automobiles, that part of salaries occasioned by training station activities and incidental expenses. Dividing this sum by the 234 health workers who have been at the station shows an average cost of $200 per trainee. If the average county budget is taken at $10,000 per year, and if five or six county departments will be saved from failure by misplaced personnel, the expenditures of the training station will have been well invested. It is hoped that the benefits to all the counties in providing some preliminary training for its health workers will more than repay for the money invested in their training.

In conclusion, I may quote Dr. W. G. Smillie, who reported two years ago on the experience at Andalusia, Alabama, in the field training for health officers, and whose observations apply equally well to the training of all health workers at Indianola:

"It is obvious that one to two months of field training cannot prepare the prospective county health officer for all the contingencies that will arise when he assumes his new duties and responsibilities in an independent post, nor does this period of training give him even a ground work in the fundamentals of preventive medicine. The chief value of the field training is that it stimulates an enthusiasm for public health work and develops a public health sense. Furthermore, it enables the trainee to learn the routine and to balance his program. It also gives him an inkling as to the varied activities of a county health officer and the relative values of the various activities."

At present these training stations are filling the gap until the time when our schools of medicine, public health, and public health nursing will provide a sufficient quota from which to draw the majority of our county health workers. Even then there will be a need for some form of practical field training in rural public health methods.

DISCUSSION.

Dr. Felix J. Underwood (Jackson): We will soon be in a position to balance things in Mississippi. We have been considerably out of balance. Most of the effort and most of the money up until this time has been spent in caring for wrecks, with little time to prevent the wrecks. Insane hospitals, tuberculosis hospitals, charity hospitals everywhere wait until the wreck has happened and then get very busy to do something for the individual. I have several appeals in my pocket right here along that line. We recently had a woman at the Sanitorium for examination. Her case is one of advanced chronic pulmonary tuberculosis. We do not get the incipient cases, the early cases on account of the fact that so little individual work has been done in the unit back home. The sanitorium is filled with advanced cases.

In regard to the insane, we know cerebro-spinal syphilis, and other diseases that are preventable, will cause insanity, yet they will wait until he is insane before trying to do something for him. They will wait until somebody has a hemorrhage or other advanced symptom of tuberculosis, and then hurry to do something for him. Now with the trained and adequate personnel all over the state we shall begin in a few years to decrease the number of wrecks that we are called upon to care for.

I should state that Dr. Balfour is not only director of the training station, but is the county health officer of Sunflower County. You notice that the doctor doesn't look to be overly stout, that is from the standpoint of avoirdupois. I think we have gotten fifteen pounds off him since he came to Mississippi. He is acting in a dual position, it is a hard one; he has given his best and done splendid work.

The miracle days of biblical times are no more. Until recently we seemed to think that any practicing physician, private duty nurse, retired policeman, political lame duck—plain ordinary laymen—could go to bed at night as such and the following morning without training or previous experience take up the role of health officer, public health nurse, or sanitary inspector and get away with it. (I did not say succeed.)

Malpractice of this sort is rapidly disappearing. As much as we dislike to admit it, this was unavoidable for the reason that until very recent years there was no place to go to obtain practical public health training and experience, except as an apprentice to some self-made health officer.

A general practitioner does not become a specialist of any kind over night and he cannot become a specialist in public health, work without special study and preparation over a period of months and years. It should be a source of great satisfaction to those of us who have the matter so much at heart to see the public showing a degree of appreciation of this fact as evidenced by the demand for trained workers, adequate community health programs and less politics.

Abundant provision has been made for the preliminary stages of training and experience in medical schools and long internships in hospitals so far as curative medicine is concerned. Thus far the medical schools of the country have made very little provision for "internships" in the practice of preventative medicine. Several would doubtless argue that the public health requirements are being taken care of but on careful investigation we find only two or three that are really honestly giving the students anything approaching a real program in preventive medicine and public health.

The gradual development of a public health conscience and enlightened public opinion and demand will bring about a proper balancing of the teaching of preventive and curative medicine.

No matter how much didactic instruction a medcal student may be given, unless he also is given the opportunity to gain practical experience before assuming the full responsibilities of his office as a health worker, he will fail or will not attain the success possible with adequate practical training in the field.

For five or six years the International Health Division of the Rockefeller Foundation has maintained in co-operation with the Alabama State Department of Health a training station or center in Covington County, Alabama, which made it possible for the Alabama State Board of Health to forge rapidly ahead of most of the other states in full-time health departments. The Alabama State Board of Health now has more than 50 per cent of the entire population enjoying the blessings of intensive full-time county health work with plans well laid for the remaining counties very soon. This would be impossible without an adequate supply of trained personnel made possible by having this splendid training center organized and conducted for several years by the Rockefeller Foundation, and now, as I understand,

taken over and operated by the Alabama State Board of Health.

According to the report of Doctor Charles N. Leach, former director of the station, 283 physicians, 80 nurses, and 75 inspectors were enrolled in the Alabama station. Doctor Leach stated that 13.6 per cent of the physicians reporting for training failed to receive the approval of the director. The value of such a system of appraisal and intensive field training soon became apparent to me as a State Health Officer and I have requested training for a number of our newly appointed health officers. We also have employed several physicians, nurses, and sanitary inspectors from other states at the close of their training period. For the past three years no county director has been selected and for the past year no nurse or inspector, and from this time on no personnel will be selected, without having had a course of practical training for the particular work the person is to do.

More recently, the Rockefeller Foundation has cooperated with the State Health Departments of Ohio and Mississippi in establishing similar stations. The Ohio station was opened on February 1, 1927, at Greenville, Ohio. Approximately 40 physicians and 10 nurses have received training there.

Following the unprecedented and devastating flood of the great Mississippi Valley during May, June and July, 1927, with 90 counties in the several affected states to be organized on a full-time basis, the Rockefeller Foundation organized in cooperation with the Mississippi State Board of Health a training school at Indianola, Sunflower County, Mississippi, on July 8. Approximately 200 physicians, nurses and sanitary inspectors have enrolled. The training period is six weeks. Men and women from all sections of the United States and several from Canada have been given this emergency course, very intensive in character. The Mississippi station is built around a county health unit of the size and financial support which the average health officer will have at his disposal. Experience gained there is under conditions which will closely approximate those under which his future work will be carried out.

The first real prenatal clinic in the State was organized in this county last year. A splendid program has been carried out to the great benefit of the mothers and infants. The value of this phase of the well-rounded public health program carried out by the training center and county health department to the physicians and nurses in training is almost incalculable. The first county-wide tuberculosis and venereal disease survey will be under way soon. Pre-school conferences are frequently conducted and a splendid school program has been carried out. Already all of the towns and schools and a large number of the rural homes of the county have been made sanitary.

The Mississippi State Board of Health is no longer embarrassed and held back by lack of trained personnel for new counties for now there is an abundance of good material from which to choose health workers and success is assured where formerly only partial success or failure was the rule. The State Board of Health will eventually take over the training of its own personnel as Alabama has done.

Dr. D. J. Williams (Gulfport): I have enjoyed the paper and discussion immensely; they have left but very little for me to say. They presented an array of facts however that demand the attention of this association. Dr. Balfour has developed the fact that 50 per cent of the doctors who are attempting to qualify as County Health Officers or Directors of these units are unfit; 50 per cent of the class is only fair or better, practically the same number are given their passports to enter this work. The doctor did not mention one qualification that I think he should have mentioned. I believe that any director of a public health unit should have a rich experience as a general practitioner in a general way. I do not believe that schools can make health officers, yet there is evidently a demand for just such work as the doctor is attempting to do at Indianola. Our medical colleges have been failures in qualifying men for this work. Our public health schools have been failures, and I can point to numbers of men that they have absolutely disqualified. As to the results that we are getting from the school here, I do not know. We have some tendencies that we might well watch that exist throughout the entire educational system I know in Mississippi, and here I want to sound a warning. There are too many failures in the grammar schools of Mississippi. It is costing us millions of dollars. There are too many failures in the high schools of Mississippi, and here in the learned profession when we begin to grade the output of the doctors as qualified for public health officers, we are finding that 50 per cent of them are failures. The same thing will apply to the inspectors, and it applies to the nurses. Now something is wrong, and it is a part of the duty of this profession to help find where that wrong is. Have we the correct method of training? A man may be a perfect failure in one locality, and a remarkable success in some other, and I know personally where some of these conditions have proven to be a fact. We must learn to individualize. Otherwise you are going to continue to have a great number of failures when they get into their respective places. We must remember also that from a

goodly number of these failures, ultimately there comes success. Some of the generals in our armies, the generals and leaders in our business world, have been failures, but when they have been able to adjust themselves why they have succeeded. Just remember in all of this, that the stone that may have been cast aside, may prove to be the keystone of the arch.

Dr. M. C. Balfour (closing): I have nothing further to add other than to express my appreciation for this opportunity of presenting the subject of training in Public Health to you, and in closing would congratulate Mississippi on the progress which has been made in the field of rural health work. It has been interesting to me to note in the South, how at the present time the northern health authorities are coming to the South to learn something about county health work, and rural health work. There have been a great many visitors to the health station from the state health offices of Massachusetts, and by the dean of Harvard Medical School, as well as some foreigners who have come to see the lead which the South now has in the field of rural sanitation.

SOME ESSENTIALS IN A DENTAL HEALTH PROGRAM.*

W. R. WRIGHT, D. D. S.,

MERIDIAN, MISS.

It is a privilege and genuine pleasure to appear before you as a representative of the dental profession, and I feel sure that, as co-laborers in an effort to give comfort, happiness and health to the people of our state, I express the sentiment of my profession when I say that it is a distinct honor to take part on your program. I bring greetings from five hundred dentists who honor and respect your noble profession for its long and unbroken history of sacrifice and service to suffering humanity. Dentistry has watched with pride and admiration your wonderful progress in both medicine and surgery. This has encouraged us and helped our profession to grow. We naturally look to you for leadership in both curative and preventive measures. Dentistry being a branch of the healing science can do little without your co-operation.

It has been said that public health is the foundation upon which rests the happiness of the people and the welfare of the state. With this idea in mind, organized dentistry has become intensely interested in contributing its share to the public health program. Since such men as Mayo, Hunter, Osler, Bloodgood and other medical authorities have expressed their opinions in no uncertain terms regarding dental health as being absolutely essential to any general health program, and since these opinions have been supported by clinical experience, and the same views are held by dental authorities, I assume that any space given to this phase of the subject before a group of medical men would be useless.

In presenting the essentials for carrying on a dental health program I shall first call your attention to what I consider of first importance: the attitude of the dental profession to the dental health program. It has not been long since there was a different attitude toward dental health publicity work on the part of the dental profession. Dentists were not in accord on the subject. Some felt that the public did not need dental health work and that there was an ethical phase to the publicity necessary to carry on a dental health program. There were many far-seeing men in the profession, however, who realized that the physical betterment of mankind depended in a large degree on mouth conditions and that the dental profession would have to play a large part in managing any great mouth hygiene campaign. Gradually the dental profession became united in the conviction that mouth hygiene must be presented to the people.

The second essential in presenting a mouth hygiene program is the co-operation of the medical profession. This means more than we can estimate. There are sections of the state where dentists are few, particularly in rural districts. There the

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family physicians can be of wonderful assistance in properly educating parents and their children in the proper care of the teeth. Parents should be advised to have the teeth regularly inspected to find the first stages of trouble and the proper corrections made and diet prescribed. In the pre-natal life the medical men hold the key to the situation.

The expectant mother is often told by friends and neighbors that she must have no kind of dental work done during pregnancy. Therefore, she avoids the dentist and is denied his advise as to the care of her teeth during that important period. In this way the pre-natal child is removed from the sphere of dental service and advice and the responsibility thrust upon the physician. We are only beginning to realize how necessary to the future health of the child is the diet and care of the mother during pregnancy. In many cases of pregnancy only a midwife is called and this presents another difficulty. This leads to the belief that that profession should be well prepared to take charge of this phase of dental health. Thorough co-operation of physicians and midwives with the program of the Mississippi State Board of Health will help us advance a long way toward the ideal.

With the dental profession awake to the importance of mouth hygiene publicity and the co-operation of the medical profession the next essential in the general health program is a public educated to the need of preventive dentistry. Realizing that the place to start in this educational campaign was not with the present generation, the child mind offered the best approach to the presentation of a general mouth hygiene program along with the general health program. Reviewing the success of these campaigns as conducted in our state it is hard for us to realize the many difficulties that confronted the pioneers in that movement. Today we have a public that recognizes the importance of the work and is willing to co-operate with the program of the State Board of Health. Evidence of this fact is shown by the law providing for a dentist on the State Board of Health.

Having the child take the proper attitude toward the care of his teeth is an important essential in carrying on a dental health program. Where dental health programs have been conducted a great deal has been accomplished toward having the co-operation of the child in the attitude taken to the work. The deportment of the child in the dental office has been greatly improved. The dentist is no longer a terror to him. Where dental health programs are conducted in the schools the dentist is the friend who helps the child secure his one hundred per cent certificate to help his school become a one hundred per cent school. A holiday is looked forward to when the school finally arrives at one hundred per cent and the child feels that he has helped the school attain this distinction. Later on the child realizes that there is another side to what he is doing, that his health and happiness depend on doing his whole duty in the care of his teeth.

So we have laid the foundation for the advancement of a mouth hygiene program which we have the co-operation of the dental profession, the support of the medical profession, the public awake to its needs, and the child willing and anxious to take its part. I am glad to say that Mississippi has arrived at this goal.

When the Mississippi Department of Health decided to enter the field of mouth hygiene a careful study was made of the plans used in the several states when engaged in this work. It was soon realized that it would be difficult to adapt to our state any of the programs then in successful progress elsewhere on account of our large rural population, and our small percent of foreigners, and the limited finances available to support our program. We reviewed our situation and it was thought best to employ one full-time health worker and institute an educational program. It was gratifying that the public school

system entered so heartily into the work. It was not long before the general improvement in the health, scholarship and deportment of the pupils was marked. The story of the progress of the work is no doubt known to many of you. I wish I had time to go fully into this at this time but I have not. You know that under the direction of Dr. Felix J. Underwood, Executive Officer of the Mississippi State Board of Health, Miss Gladys Eyrich, Director of the Department of Mouth Hygiene, assisted by an advisory committee representing the Mississippi Dental Association, that perfect harmony has prevailed. We are confident that the plan now in use is well suited to our needs. In fact, we are often called upon by other states to assist in the preparation of such programs and our success has been noted widely. We have recognized in Mississippi that mouth hygiene is a part of the general health program and that as such it should be carried along with it and not independently.

So much for what we have done in the past. Our aim in the future is even more ambitious. The work we have done has been elementary in a way but the elementary is always necessary to further advancement. There are certain improvements and developments in the work as carried on that are constantly confronting us. One of these is the change in the form of dental certificate that has been issued for the examining and corrective work done by the dentists. There has been no understanding about a uniform certificate. However, the State Council on Mouth Hygiene will recommend that in the future a dental certificate must not be issued until all cavities both pit and fissue in both temporary and permanent teeth are filled, teeth cleaned, and all abscessed teeth and roots (temporary and permanent) be removed and all unfillable teeth sterilized with nitrate of silver. With this uniform certificate we can make greater strides and be able to give a more accurate check on our work.

Another advancement that we need to make is in the number of examinations of school children. We know that a one hundred per cent mouth in September may not be one hundred percent in January. Therefore, much damage may result from delayed attention to defects. We need to have a mid-term examination of the school chidren's teeth each session.

In order to carry on the mouth hygiene program already started by the State Board of Health and in co-operation with dental and other agencies, we are going to have to depend more on the hygienist. The hygienist is a product of dentistry. She is to dentistry what the trained nurse is to medicine. She educates through her acquired skill and knowledge of mouth hygiene. She is considered by the dental profession its most available aide in putting over its preventive programs. The school authorities of McComb, Laurel, Meridian and Vicksburg have been aided greatly in their work by the hygienists they have employed and their salaries are paid by those cities in connection with the State Board of Health. We believe that there should be a hygienist on the faculty of every city school system of five thousand people, that a hygienist should be placed in each elemosynary institution and be a part of each country health unit.

The well-rounded dental health program must not be satisfied with the pupils in the public and parochial schools. We have used them as a beginning. There are others who need dental health work and we are responsible for them as well. Adults in our state institutions could be greatly relieved by this work. It has been shown that marked improvement has resulted from the correction of dental defects of the parents in the Mississippi Hospital for the Insane. Especially should our program include the tubercular patients.

Looking to the future for a developed program including pre-natal life and the pre-school child and a continuation of what

we have already developed Mississippi can boast of a thorough program of mouth hygiene work. The pre-natal life aspect of our program will be largely educational, as has been pointed out above. This we have barely touched as individual professional men and not attempted to a great extent in our state program. However, the field is ready for the work with the pre-school child. There are many agencies such as the Parents-Teacher organization that are interested in this phase of dental health work, and along with the general physical examinations have been put on in several communities of Mississippi. The pre-school child problem will solve and reduce the work with the school child when we have finally worked out a definite plan of approach.

In reviewing the work done in Mississippi we have already advanced wonderfully and should feel encouraged as to the future outlook. There is no doubt but that the budget for the maintenance of our public school system will be so greatly reduced when we have finally perfected our dental health program in Mississippi that the money now expended on habitual failures in pupils to make the grades and the expense of lagging children will pay for the support of the entire health department of our state.

The dental health program of the Mississippi State Board of Health is an important factor in the economic development of the state. When we shall have it functioning to its utmost the result will be more capable men and women, with less or crime and a happier citizenship. From the humanitarian side we will have less suffering, greater longevity and a higher moral tone among our citizens. Is not the risk worth while?

DISCUSSION.

Dr. F. M. Smith (Vicksburg): I enjoyed Dr. Wright's paper very much. He covered the health program from a business standpoint, from a public health standpoint, not only for the present, but he covered the work that has been done in the past and has given a vision of what we may expect or hope to accomplish in the future.

He states three or four essentials that he deemed necessary in this program. One was the attitude of the dental profession; second, the attitude of the medical profession; and third, the co-operation of the public. It has been my pleasure as a public health worker for a number of years to find that the dental profession has been anxious and willing at all times to co-operate in furthering this program. I do not mean to say that they have looked at it from a medical standpoint, but they saw the situation as it actually is; they saw that the child should learn early to care for its teeth, and after corrections are made, he becomes the friend of the dental fraternity for life. In this way he gets protection of health through the care and preservation of the teeth.

The educational part he has covered well. It may be worth while for us to talk of the oral hygenist and her part in the public health program. He said the care of the teeth is only part of the work of caring for the whole human body. You cannot disregard the necessity of caring for the teeth any more than you can caring for the vision of the eye, or any other part of the body. We know what a part it plays in the life of the individual. The oral hygienist we believe, in her connection with the local public health department, is just as important as any other of the personnel. She should be a part of that unit and realize that she is a part of the unit. She is chosen by the health department, and she is responsible to this department. Her work now is the pre-care of and cleaning of teeth but she is part of this health department. The oral hygienist in the city of Vicksburg is given a sheet on which to keep a daily record. Every day of the month she is supposed to keep a record of all public talks and of birth certificates delivered. In delivering these we give her a great opportunity to talk to the mother on the preservation and care of that child's teeth—the baby's teeth. The oral hygienist may sometimes have to put placards at the homes where there are communicable diseases, but it is a golden opportunity for her to tell of the dangers of these communicable diseases. She makes pre-natal visits, and keeps a record of school visits, pre-school visits, talks and drills, cleaning teeth, posters of O. K. children, pre-school examinations, work with health departments, school children corrected, adults corrected, and tooth brushes distributed.

Dr. W. D. Beacham (Hattiesburg): I have enjoyed this paper very much. We have with us Dr. J. F. Brunson of this city, and as our time is limited, I shall gladly give him my time to discuss this paper.

Dr. J. F. Brunson (Meridian): I just came out to hear Dr. Wright's paper. I hadn't even seen the paper, but I know his mental trend so well that I had a pretty correct idea of what would be contained in that paper. Mississippi as you know has been a pioneer in mouth hygiene work. When we inaugurated this work, the way was uncharted, so we had to work out our own problems. How well we have succeeded is indicated by the fact that we are called on to advise with this work in other states. The dental hygienist is new not only to Mississippi, but new everywhere. I am sure that time will show the dental hygienist to be more and more useful in this important field of public health work.

We went farther in our new dental law than any other state in the latitude given the dental hygienist. The dental profession is afraid of the dental hygienist, and is cautious in giving her latitude in her work. But in the new law the dental hygienist has the right, under the direction of the dentist, to make such applications to the dental caries as will arrest decay, and no other state in the union has gone so far. I have had occasion to investigate the laws of practically all the states of the union in getting this law compiled. There are three agencies that materially assist in arresting dental decay—nitrate of silver, chloride of zinc and copper, and under the supervision of the dentists, the oral hygienist will be allowed to make these applications as they are indicated. The dental hygienist will earn her salary if she did not do a thing else but make the application of nitrate of silver to the temporary molars of the small children in the schools to arrest the decay of those teeth. The proper solution of copper will arrest decay, not only superficial decay in permanent teeth, but will arrest decay in the temporary teeth. She will more than earn her salary if she did not do anything else. I thank you for this privilege of saying just this word.

Dr. H. K. Tippin (Gulfport): I would like to ask Dr. Wright what the consensus of opinion is as to the devitalized tooth if it is not abscessed? Does that disseminate toxin throughout the body or not?

Dr. Felix J. Underwood (Jackson): I want to say just this. Of course none of us here doubt the great need for preventive dentistry. We do not need to have to go to the school for information, just look around for ourselves, open the mouth of the fellow next to you and you will see the need of this. I want to make this statement: that Dr. Wright has been a most valuable member of the State Board of Health. I do not think of him as a dentist until I need him on this mouth hygiene program and go to him. The fact of the business is, he is with other dentists—prominent ones who are interested—guiding this program, but I never look upon Wright as a dentist, but just as any other member of the board. He has fitted in so well, we feel that it is a solid board without any reference to dentistry or what not. I do not look on him as a member of any profession except when I go to him for counsel and pleasure. It has been a pleasure to work with Wright. He has been a great help to me personally, and to our program, dental programs as well as public health programs.

Dr. D. J. Williams (Gulfport): Pursuing the line of thought suggested by Dr. Tippin, I would like to ask what the opinion is with reference to extracting primary teeth in children. It has been our experience both as health officer and doctor that a number of dentists, and I recognize the fact that there are all sorts of dentists like doctors, get up a notion and probably refuse to extract the teeth of children whose gums are abscessed and whose roots are partly absorbed, and they are sitting up there just like a splinter in the mouth. I want to know just what the leading members of the dental profession think—what their attitude is as to the extraction of these teeth?

Dr. Wm. R. Wright (closing): I appreciate the discussion of my paper by Dr. Smith very much. I believe if we had had a lot more time we would have gotten a great deal more out of his discussion than out of the paper, and probably did.

I think Dr. Underwood has been overly generous in his remarks; however, it has been a pleasure to serve with the Board and help in any way that I could. And I will say in answer to the gentleman's question in regard to the devitalized tooth—pulpless tooth as we call it—that he asked me a great big question. That is a question that the dental profession itself has not settled nor solved. I think that I can safely say that the majority of the members of the dental profession feel that a pulpless tooth, which under roentgen-ray shows no rarified area and no indication of trouble, is serving a good purpose and we leave it where it is. I think we are growing more conservative all the time in regard to that, but in cases of pulpless teeth that show an unhealthy area, the profession is pretty well united on the removal of that particular tooth.

And I would say in answer to the question of Dr. Williams in regard to an ulcerated tooth, or an abscessed tooth, that that also is a question that is a little hard to answer under certain conditions. Now if you have a tooth that is sitting directly in front of the first permanent tooth—that is, on the six-year molar, probably holding it in place for a short time, under certain conditions the dentists prefer leaving that tooth there

to retain the proper relationship to that molar, but personally I have about arrived at the conclusion that any part of a tooth that is abscessed should be removed at once.

I certainly thank you very much for your time and consideration, and before I sit down I may not have another opportunity, I want to tell you medical people that dentistry feels under great obligations to certain members of your profession who gave assistance to the dentists in getting a very constructive dental law passed by the last Legislature. You had medical men as chairmen of the two committees in the House and the Senate that these bills come before, and they were very courteous and helpful to us, and we certainly appreciate that very much.

HYPERTROPHIC PULMONARY OSTEOARTHROPATHY.*

LESTER J. WILLIAMS, M. D.,

BATON ROUGE, LA.

This very interesting condition has been recognized as far back as 1889 but so few cases have been recorded that it might be of interest to this Society to present a case that possesses all of the symptoms that students of this chronic condition have detailed.

The early history of hypertrophic pulmonary osteoarthropathy shows that it was named by Marie in 1890, although in 1889 von Bamberger was the first to describe it. Locke in 1915 collected a series of 144 cases and definitely established its relation to the Hippocratic fingers. Prior to this Wynn published 100 cases.

To Hippocrates we are indebted for the first step in the diagnosis of this disease for it was he who noted the connection that existed between clubbed or drumstick finger ends and lung disease, and the further changes of the bones have been observed by later writers.

The clinical signs of hypertrophic pulmonary osteoarthropathy are divided into two groups, the first is of the soft tissues and is marked by a bulbous swelling of the ends of the fingers and toes. This clubbed or drumstick finger end is called "Hippocratic finger" in honor of the first to mention it. The drumstick finger end is in all likelihood due to hyperemia of the terminal vessels with a fibrous thickening of the subcutaneous tissue for there are no bone changes that accompany this spatulation of the finger ends. The second is confined to the long bones, in which there is a periosteal hypertrophy with subperiosteal deposits of irregular new bone.

The cause of the bone changes is not very definite, as there are several theories to account for the change; it may be that a passive hyperaemia from the restricted pulmonary circulation may account for it, although Marie and Sternberg believe that the changes are toxigenic. The latest theory however is that there is a liberation of nitrogen gas in the bony structures, with an elevation of the periosteum. Bamberger some 36 years ago stated: "The etiology in most cases is uncertain," and up to the present time there has been no great mass of testimony to contradict this statement.

It is not amiss in this paper to call attention to the fact that this so-called Marie-Bamberger disease is not limited to human beings for in 1926 Ball and Lombard reported a case in a ten-year-old lioness. It is interesting to note that since the lioness had last borne young the condition has progressively grown worse. The lung involvement was that of pulmonary tuberculosis with bronchiectasis. All the bones were involved.

Several cases of this disease have been treated with deep roentgen-ray therapy and while no astounding results have been obtained, it is apparently indicated in osteoarthropathy following a malignancy of the lungs, for while not curative some of the symptoms are greatly ameliorated.

The present case, J. B. C., an undernourished, scrawny, undeveloped boy of 10 years complained of pain in chest when coughing, and this was almost continuous, with the expectoration in large quantities of a foul, thick purulent sputum. He

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also complained of pains in both legs. Both feet were swollen and all extremeties presented a skin lesion that resembled ichthyosis. His fingers showed the typical "Hippocratic" condition.

The family history was irrelevant. He has had measles, whooping cough and typhoid fever. In 1918 pneumonia followed influenza. He was said to have had abscess of the lung, but was not aspirated and gradually became better, although his cough continued with profuse expectoration. There was no history of temperature, but the patient never felt well since the attack in 1918. He experienced great difficulty in lying down, finding trouble in breathing, and even when standing there was quite a wheezy breath sound.

The physical examination revealed a boy 13 years of age with an apathetic appearance, slightly labored respiration and expectorating profusely a greenish-white pus, especially when attempting to lie down.

The skin was dry and scaly with a hard papular feeling, apparently ichthyosis. The head and neck were negative. The thorax showed a poorly nourished chest with prominent ribs and clavicles. Both ribs and clavicles were larger than normal and bulged in all directions. Breath sounds were exaggerated over the entire lung area, except lower left side posteriorly where they were diminished. In this area spoken and whispered voice sounds were increased. Mucous, sibilant and sonorous rales were heard over the entire chest. No crepitant rales were heard. Heart was enlarged to the left and downward. No murmurs.

The sputum was examined and found negative for T. B., bronchomycosis and bronchospirochetosis.

Roentgen-ray examination shows the lesion limited to the shafts of the long bones both humeri, both ulnae, both radii, the femora and both tibiae and fibulae. The phalanges of the fingers were negative for bony pathology, although pronouncedly "Hippocratic." No pathology was noted in the phalanges of the toes, nor was any observed in the carpal bones, tarsal bones, clavicles, scapulae, ribs or patellae.

The lesion was apparently an elevation of the periosteum.

There was no involvement of the joints and articular surfaces.

The lungs under roentgen-ray examination exhibited a multiple abscess formation in the lower lobe of the left lung, probably of long duration.

I am indebted to Dr. Cecil Lorio who referred this case to me originally and also to Dr. J. W. Watson who allowed me to watch the progress of the case.

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DISCUSSION.

Dr. Cecil Lorio (Baton Rouge): I would like, first of all, to congratulate Dr. Williams on his presentation of this case, and to lay stress on one particular clinical sign or physical sign which is as yet unpublished in literature.

This child presented himself to me some two years ago, having just returned from Charity Hospital, under observation and having had a complete examination of sputum by Dr. Castellani, who reported negative tuberculosis and negative fungus infection of the lungs. The child was in a bad condition when I saw him at home, and was morbid.

The history of the child is that, eight years ago, he developed pneumonia, and, on the sixth day, the diagnosis was made pneumonia, lobar pneumonia; the temperature went to normal and remained normal for about twenty-four hours. After that, the child began to get progressively worse and a diagnosis was made a week later of empyema. One month later, the child suddenly coughed and expectorated large quantities of pus, rupturing through the lung, and, after expectorating, experienced relief. This relief was only temporary and, later on, the cavity was refilled and refilled and the child has been in this condition ever since.

Dr. Williams has mentioned the scarcity of literature, which is correct, because he and I have inquired through every source possible for some literature on the one particular sign, that is, the elevation of the periosteum. The bulging of the fingers, that you may see in a chronic heart are not the same as the one associated with the chronic hypertrophic osteoarthropathy, in which case you have an elevation of the periosteum in deep position.

The one particular thing of interest is that, in lung abscesses (I say this, speaking not from myself as an authority but from Dr. Baker, of Boston, who has at present some thirty cases that have not been entered in literature) of an individual, a new clinical sign is an elevation of the periosteum is not associated with any of the other lung or chronic infections of the lung. These cases will be presented at some later time in the literature, I am sure.

The chemistry has been made of the content of the space betwen the periosteum and the bone, and it has been found to be definitely that of nitrogen. The case that Dr. Williams reported, the child has had pain over the long bones of the arm and of the leg. The roentgenograms of those identical spots over the pain show an elevation of the periosteum without any subperiosteum borne in that position at the present time, that is, at the time the picture was taken, it did not show any. So, this elevation, without the bony deposition is of particular interest to find out whether or not the elevation of the periosteum separate from a bony deposition is only an occurrence of pulmonary abscess and not an occurrence of the bronchiectasis or chronic lung infection.

Dr. L. J. Williams (closing): There is just one point that I wanted to add. In 1922, it was thought that Torus Palatinus was a new sign of pulmonary hypertrophic osteoarthropathy. Chassaignac, who first described it as exoste mediopalatine, thought it a sign of syphilis, but that has been proven a mistake.

I thank Dr. Lorio for his discussion of this case, and I hope at some future meeting we will have more papers of this kind, so as to have a more general discussion.

OBSERVATIONS OF PNEUMONIA.*

CHAILLE JAMISON, M. D.,

NEW ORLEANS.

The material presented consists of those cases of pneumonia which have been typed, admitted to the Charity Hospital during the last two years, and also of certain studies based on the observation of cases of this disease admitted to Medical Service Six, which is one of the negro male Medical Services at the Charity Hospital. The incidence of the disease, the type, morbidity, mortality and the effect of syphilis are considered. The following observations refer only to pneumococcus pneumonia; certain cases of streptococcus pneumonia have been reported elsewhere (1), and a pneumonia due to an organism which is as yet unidentified positively, is to be reported at a later date. No attempt is made to study symptoms, physical signs, or routine laboratory findings. Terminal, aspiration, and focal pneumonias have been excluded. Table 1 is a graph representing

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the months in which pneumonia is most prevalent. There seems to be a difference in the seasonal occurrence to that of the Northern States. The greatest incidence in this locality is in February; March, January and November nearly equalling it, and being about equal to one another: January, February, March and April lead in the North. (2). There is a curious falling off in December, which is probably seen only in Hospitals and not in general practice. The summer months are almost free of this disease, and one can see that it is a real problem for only about six months out of the year.

Table II gives the percentage of the four types. It is understood that all cases of pneumonia admitted to the Hospital were not typed, but those that were typed and are here presented were unselected cases, and it is believed give a fair view of this phase of the subject. These figures are of interest as they differ quite materially from those of other localities, where such studies have been made. The occurrence of Type I is about the same, of Type II considerably greater, of Type III and Type IV very materially less. From these figures it can be seen that Type I and II account for 75 per cent of cases of pneumonia seen in the Charity Hospital. From figures drawn from other sources Types I and II account for from 50 per cent to 60 per cent of cases. Type III is very rare locally and Type IV materially less than either Types I or II. Studies from other localities though they show Type III to be the least common, is over twice as frequent as the figures presented here indicate; while Type IV occurs as frequently as Type I, these two headings the lists in other places. (3) (4).

The mortality of all cases typed was 22 per cent, regardless of considerations of age, color or sex, and this is probably a fair estimate of the mortality of pneumococcus pnuemonia in Charity Hospital. This is less than the mortality seen in general hospitals in more severe climates. Table III presents the percentage of mortality due to the various types and means that of one hundred deaths from pneumonia the percentages will be as illustrated, but does not mean that of one hundred cases of a certain type any such mortality will occur. On the contrary, so far as my studies go, the mortality of Type I is a little greater, and of Type II considerably less than that given in published figures; Type III is about the same, but Type IV is practically negligible as a death-producer.

The differences in incidence and mortality of the various types of pneumonia account for a conclusion of great importance, and that is that 75 per cent of the cases and 79 per cent of the mortality of pneumonia in this locality are due to Types I and II.

The duration of the various types of pneumonia was studied in fifty cases occurring in negro men in Medical Service Six during the past two years. This averaged 12 days. Cases of Type I averaged 10 days; Type II, 9¼ days, and Type III 8 days. In this particular group no cases of Type IV pneumonia occurred; it is possible that this may be attributed to the mildness of the disease, which was such that this class of patients did not seek hospitalization.

Fifty-four cases with pneumonia were tested for the Wassermann reaction. Table V gives the result of this study and needs no particular comment, except that the incidence of syphilis was found by this method to be only about 20 per cent, while it is well known that the incidence of this disease is much higher than this in the negro male. The presence of active syphilis seemed to prolong the pneumonia.

If conclusions are justified, based on the study of such a small number of cases, it would seem that so far as type, seasonal incidence and mortality are concerned, there is a marked difference between pneumonia in this and other localities.

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TABLE I.

TABLE II.

Fifty-nine cases were typed; 22 white and 37 colored. The following table gives the number and percent of each type:

Table I	33 per cent	21 cases.		W6 C15
Type II	25 "	15 "		W7 C8
Type III	5 "	3 "		W0 C3
Type IV	18 "	10 "		W6 C4
Type I and II	17 "	9 "		W3 C6
Type II and III	2 "	1 "		W0 C1

TABLE III.

The mortality of all cases typed was 22 per cent white and colored, both sexes.

Type I	40 per cent
Type II	33.3 "
Type III	6.6 "
Type IV	6.6 "
Type I and II	6.6 "
Type II and III	6.6 "

75 per cent of the cases and 79 per cent of the mortality in lobar pneumonia due to Types I and II.

TABLE IV.

It was possible to determine the average duration of the disease in 50 negro men. This averaged 12 days.

Type I averaged 10 days.

Type II averaged 9¼ days.

Type III averaged 8 days.

TABLE V.

The Wassermann reaction was done on 54 cases of pneumonia in negro male adults.

Positive 10.

Negative 41.

Anti-com 3.

The average duration of the pneumonia in the positives was 15 days. None died.

DISCUSSION.

Dr. T. B. Bird, (Baton Rouge): I think most of us are rather listening to the call of the dining room most at this time, and our time is naturally very limited.

Anyone who has dug through the records at Charity Hospital to get up statistics will appreciate, most heartily, the word that Dr. Jamison has done, and I think in discussing the subject of pneumonia, he has maintained his usual high standard of excellence. I believe that the mortality that he has, as a whole in pneumonia, is gathered primarily from the large institutions, and, unfortunately in medical cases, most of our institution statistics are based on the charity units, and they are notoriously bad, so, just what the statistics are in private practice, it is hard to tell.

Charity institutions, where Dr. Jamison and most of the rest of us work, these patients come in very late and in many cases they are desperately sick patients, sometimes we almost think they are sent in there in order to avoid repairing some doctor's statistics as to private practice.

There is another thing where we must remember, that is pneumonia is the only disease known to science in which the mortality records of the profession have gone backwards in the past generation, and the question arises as to whether we are leaving undone something that our father's did that was right, or whether we are doing something that our father's omitted that was wrong.

I think that Dr. Jamison's work in typing has been particularly interesting, and he deserves unusual credit in that many of the services are not making an effort to type the cases. He at least has given us something to think about, and that is what we come to these meetings for.

Dr. L. R. Debuys (New Orleans): I want to congratulate Dr. Jamison on his excellent presentation. Presentations such as the one he has just offered tend to stimulate us to do better work and are those from which we secure information to add to our fund of knowledge.

His analysis of the pneumonias at the Charity Hospital is indeed interesting and thorough. There can be no discussion of the statistics for they speak for themselves. It seems to me that that feature of his work, the typing of the pneumonias, offers an unusual opportunity for further investigation. Why should there be just one type of pneumonia for which there is a serum? How many times do we avail ourselves of the serum in that particular type? Why is it that in the other types the various serums have not been of any

use? We might offer explanations and theorize from now on, but in conducting the work as he is doing it is very likely that he may give us some valuable information in the future.

Dr. Chaille Jamison (closing): This study is only preliminary, gentlemen, and we are carrying it on and expect to carry it on very carefully for many years to come.

Now, the point which I wanted to make, and what you are most interested in is this, can we have a method of treatment which is specific for pneumonia; is going to cut short the length of our patients' sickness and give him a better chance of living? I believe that the answer to that is "yes." I use it advisedly. The hospital, however, as Dr. Bird pointed out, is not the place for us to determine that, because we get our patients too late. It is for the man who is called in early.

For instance, the hopeful thing up to now is, that type one serum is practically specific, the results are dramatic, particularly if given early and given in sufficient amounts. So far as we have been able to observe polyvalent serums have no avail against anything but type one. They have little or no effect on type two or three.

TREATMENT OF PLEURAL EFFUSION, INCLUDING EMPYEMA, BY EVACUATION AND AIR REPLACEMENT.*

With Consideration of Twelve Cases of Empyema So Treated

J. A. DANNA, M. D.,

NEW ORLEANS.

The subject of empyema has interested the medical mind since the earliest recorded times. The profession paid little general attention to it, however, until the measles, and later, influenza epidemics during the world war. Large numbers of cases were treated in various military camp hospitals in many of which separate wards and departments were set aside for the treatment of empyema. When the reports to the Surgeon General began coming in and were tabulated and studied, however, an appalling condition of affairs was revealed. The mortality ranged from 30 per cent to 70 per cent, and the conclusion was soon reached by those who had the responsibility that there was something wrong with the existing methods of treatment of empyema. It was found that the highest mortality occurred when thoracotomy was performed immediately after a purulent effusion was recognized. A very material lowering of the death rate followed the adoption of a rule not to do open thoracotomy till inflammatory infiltration of the pleura and mediastinum made this proceedure less dangerous several days later. The use of Dakin's solution to sterilize the cavity and supposedly soften and liquefy the exudate very materially shortened the period of convalescence, and reduced to a minimum the number going into the chronic stage and requiring further and more extensive surgery, and contributed further to lowering the mortality rate. More recently, so called closed drainage has become popular in some quarters, a rubber catheter being inserted through a trocar or small intercostal opening and an attempt made to maintain constant drainage by negative pressure through some form of suction, the cavity being irrigated at various intervals with Dakin's or some other solution. The average man doing general surgery, however, is not quite sure that perfection has been reached by any of these methods in the treatment of this condition. Any contribution to the subject at this time should, therefore, be timely.

I have been doing air replacement in the aspiration of effusions of all kinds in the pleura since returning from overseas, where I became very much interested in the subject as a result of the work of Morelli, the pupil and successor of Forlanini at the University of Pavia, who was in command of Ospedaletto 79, a special hospital for the treatment of thoracic wounds, a few miles from the location of Base Hospital No. 102. In a published monograph which has been translated into English by Lincoln Davis under the title of "Wounds of the Lungs and Pleura", he

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reported a large number of chest wounds treated by closed pneumothorax with a remarkably low death rate. He laid stress on emptying entirely every hemothorax, substituting a closed pneumothorax. He did not however, treat empyema this way.

My experience has covered all manner of pleural effusions: cardiac, pleuritic, traumatic, from malignant disease and finally frank empyema. My first experience with the treatment of empyema by this method dates back to February 22, 1923, when I aspirated a patient with a pleural effusion following an influenzal pneumonia. The effusion was purulent and I felt that I would have to do a thoracotomy but the patient was so sick that I decided to wait. I removed, however, 360 cc. of pus by aspiration, replacing the fluid gradually with air, one syringeful of air being reinjected as each syringeful of pus was removed. The patient was very much better next day and for several days after, so the thoracotomy was postponed. As her temperature again rose and she again grew sick, another aspiration was done in the same manner and then a third and finally a fourth, after which she was clinically well. A Roentgen-ray picture three months later showed a perfectly normal chest, so that to my amazement I realized that I had cured a grave case of empyema by the simple process of aspiration and air replacement. I was inclined to consider this rather an accident but resolved to try out the method again at the first opportunity. This opportunity was a long time presenting itself, however, as often happens in our clinical experience. It was not until October 20, 1925, that I had another opportunity to use the method. This was in an old man who had been admitted to the Charity Hospital one month previous in a genito-urinary service with a probable diagnosis of pyelitis. Pus was finally found in his chest. He was in a rather desperate shape as a result of being sick so long. Four aspirations were done on him, a total of 1500 cc. of pus being removed at weekly intervals, the pus each time being replaced by an equal quantity of air. He had a rather chronic form of empyema and had been sick a long time before securing treatment but responded as well to the treatment as the previous case, which had been quite acute. I now felt, therefore, that there must be something to this treatment and I was quite eager to try it out further.

Within a year after the discharge of the second patient, five other patients who came under observation and in whom the treatment was persevered in, also got well, making a total of seven cases. Three additional cases were seen during this same period. One, an old man of 75 who had double pneumonia three months previously, died two days after a second aspiration which was unsuccessful in that only 20 cc. of fluid was obtainable—the needle being blocked by fibrinous exudate. He died with all the acute symptoms of pulmonary embolism. The two other patients deserted before completion of the treatment. I have now under treatment three other patients, who, I have every reason to believe, will also get well. I have just discharged an eighth cured case. Physical examination and roentgen-ray pictures two weeks after the last aspiration showed no signs of fluid, and during the same period she has had normal temperature and has grown steadily better. I am going to show some slides illustrating her case.

TECHNIQUE

An attempt is made by physical examination and study of roentgen-ray plates to locate the site of the effusion. A point in the inter-costal space corresponding to the lowest point of the empyema cavity is anesthetized with one-half per cent novocain solution, infiltrating all the tissues from skin to pleura inclusive. A large sized needle is now attached by a rubber tube connection to a 50 or 100 cc. Luer syringe. A syringeful of pus is now withdrawn, the tube clamped, syringe disconnected and emptied and then filled with an equal quantity of air, re-connected to the tube and needle and the contained air injected.

This is repeated until on aspiration air comes through the needle, which shows that the needle point is above the fluid line. The patient and needle are manipulated so that the needle rests in the bottom of the pus cavity and the procedure repeated until air again comes from the needle, which indicates that all fluid has been removed. The needle is now withdrawn. Where the amount of pus is large, a second spot in the chest wall is infiltrated with the anesthesia solution and a second smaller needle introduced. The first needle is connected to the suction apparatus, and the second needle to some form of pneumothorax apparatus whereby the amount of air which comes through can be measured. In this way the chest is very rapidly emptied and as each 200 or 300 cc. of fluid is withdrawn, an equal quantity of air is injected, permitting the hydrostatic or rather the physical compression of the lung to be undisturbed. The amount of pus removed has varied from a few cc.'s to as much as 3000 cc. at one time. The procedure is repeated as often as the fluid accumulates or on an average about every five or six days. Patients leave the operating table feeling relieved, and, having had no discomfort during the procedure, except for the local anesthesia infiltration, willingly and cheerfully submit to subsequent aspirations. Our limited experience has made us strongly feel that complete emptying of the cavity is essential to bringing about a cure. In one case this was done with one aspiration. Some cases have had ten or more. The average has been about three. The patient's temperature drops to normal after the aspiration and almost immediately the patient feels very much improved, is able to eat, sit up, and take an interest in all things about him. If the aspiration is not immediately followed by this improvement, it means that there is another cavity which has not been reached or that the patient has some other serious pathology which is making him sick and a diligent effort must be made to find it.

If the ordinary chest needle gets blocked, we use the large many-eyed needle with holes in the side as well as in the end. If this also gets blocked, a small intercostal incision is made and the patient turned so that this lies in the most dependent spot. A forceps is introduced, dilating the opening and removing such masses of fibrin as may present themselves. The patient is instructed to perform forced inspiration and expiration until the cavity is entirely emptied of fluid and fibrin. The patient now takes a deep inspiration and the forceps is withdrawn and the opening permitted to close. A compact dressing is applied. As the opening is small and can be completely controlled by finger pressure the patient is not shocked. It readily closes without drainage.

When first seen, it is often impossible to definitely determine the size and location of an effusion by physical examination and the roentgen-ray picture alone, especially if it has been taken with the patient lying down and with the plate under him. The removal of a small quantity of fluid and its replacement by air makes a study of the size and site of the cavity very much easier. The radiographs must be taken sitting up, however, with the plate in front of or behind the patient or laterally against the chest, the rays being directed in a horizontal direction. In this way the fluid line is shown and the outline of the cavity above the fluid line can be clearly made out. Even if only a small quantity of air is present, by repeated change of position the various walls of the cavity can thus be definitely made out. Of course when the cavity has been entirely emptied, and refilled with air, its outline stands out clearly in the picture but even if the cavity is nearly empty, if the picture is taken lying down with the rays directed perpendicularly, it may show nothing indicative of a cavity.

In the treatment of these cases, we have learned many things about empyema cavities that we did not know before. For instance, our second case had three separate

cavities, the roentgen-ray pictures showing three separate fluid lines. These cavities communicated with each other and by rolling the patient first one way and then the other, we were able to get the fluid from all cavities against one side of his chest wall and aspirate it. Another thing we have found is that in some of these patients there are separate cavities which do not communicate with each other. The eighth and last cured case comes under this category. In this case, after evacuating quite a large cavity of pus and replacing the pus with air, the patient continued to have temperature and to look sick. The roentgen-ray pictures showed a dense area, and aspiration revealed a larger cavity, above the one which has been previously emptied. This was also treated the same way and she has since gotten well. One case now under treatment started out as a pyopneumothorax, supposedly following pneumonia. Air was present in her chest before a needle had ever been placed in it.

As spontaneous pyopneumothorax is usually looked on as a fatal condition, it is interesting to see what the progress of this case will be.†

Another point that we have learned is that empyema cavities are often irregular and may be in any position in the chest. We used to think that the pus poured into the pleura and gravitated to the lowest part of the cavity. This is very unusual for even when the cavity is in the lower part of the chest, it is usually walled off and if you go a little in front of or behind a given spot, you may miss it.

I have sometimes been very much annoyed by the fact that the largest needles we could procure would become blocked. I had a large one made with a number of eyes in the side of the needle. This worked very much better than the others but sometimes even it gets blocked. In exasperation, I made a small buttonhole intercostal incision in the sixth case, a little girl about 8 years of age, made her empty her chest by forced inspiration and expiration, removed large chunks of fibrinous exudate and after making sure that there was plenty of air in the cavity, closed the opening with a gauze pad. This cavity did not drain any further and the incision had to be reopened with the forceps to let out some fluid a second time. This time the cavity was thoroughly emptied and the patient made a beautiful recovery. The criticism may here be made that this case was not treated by aspiration and air replacement. But she was, with only this difference, that the pus was not removed with a needle but was removed nevertheless and the fluid was replaced with air, the cavity being immediately closed so that she can be said to have received the same treatment as the others. Altogether, three cases—including one case now under treatment—have been incised and the cavity permitted to close again in the same way. They do not drain. They close up readily.

Accustomed as we are to seeing vast amounts of drainage from open thoracotomy, one is surprised in the average case to find only 200 or 300 cc. of pus accumulating in an average period of six days. This to me is rather strong evidence that we will have to modify our conception of the processes involved in empyema.

What is the mechanism of cure of these cases? An abscess of the thigh or of any other soft region is treated by incision, making sure that the cavity will remain open or that its communication with the outside will not be interferred with so that all secretions from the wound can find an exit. The infection in such a case is taken care of by the tissues without any further aid. In the case of an abscess in the soft tissues, there are sloughs, as a rule, of necrotic tissue which have to become separated and thrown off. As these separate, a clean, granulating cavity is left behind which gradually closes up. There was bacterial infection in such activity; what has become of the bacteria? The treatment has removed those that were in the puru-

†She also got well.

lent fluid and in the necrotic material which came away. Those that still remained must have been destroyed by the fixed tissue cells, phagocytes, antibodies, or what not on the cavity surface. Whatever be the process, localized bacterial infection is cured by the simple process of finding an exit for the contents of the abscess cavity.

I think it should be easy to see the analogy in the case of an accumulation of pus in the pleura. If we remove the liquid and solid contents, we have done what it usually accomplished in the treatment of an ordinary abscess of the soft structures anywhere. By replacing these contents gradually with an equal volume of air, the existing relation of all structures is not interferred with so that no trauma of any kind is done. As the air is gradually absorbed, the negative pressure in the pleura is re-established till, when all air has been absorbed and the fluid has ceased to re-accumulate, the lung is now again in contact with the parietal pleura and the case is cured. If a case can be cured by this means, it has several advantages over the usual other means: There being no trauma to lung or pleura, there is every reason to feel that as happens in the peritoneal cavity where the peritoneum is not unduly traumatized following an infection, the pleural surfaces will finally be free again and not adherent as must be the case where open thoracotomy and drainage have been done. There being no drain, there is no secondary infection introduced from the outside, hence a shortening of the period of healing, less tendency to rigid incollapsible walls, sinuses, etc., that sometimes follow drainage operations. The cavity will close, for it must when all air has been absorbed—hence no chronic cavities. The patient is spared an operation, which, itself, has a certain percentage of mortality. In its stead is substituted an aspiration which is practically painless and to which the patient gladly submits again and again if necessary.

Whether all cases of empyema can be cured by this method, experience alone will teach. I present this paper with the hope that some of you may try it out and find out further its value and limitations.

NOTE—Seven additional consecutive cases of empyema have been treated in the author's service at the Charity Hospital since the reading of this paper, making a total of nineteen, not counting those leaving the hospital before completion of treatment. Five have gone home cured. Two are now convalescent and will be sent home soon. A buttonhole opening was made in one of these five, which closed immediately without drainage. Aspiration with the needle was done in all the others.

Details of Eight Cured Cases

	Age	Hospital	Admitted	Number aspirations	Total cc. fluid	Organism found	Previous history
S. B.	26	H. D.	2/22/23	4	3060	M catarrahalis B Influenza Staphylococci	Influenzal Pneumonia
J. L.	49	C. H.	9/17/25	4	1215	Pneumococcus	Fall, pain in back, pyuria
L. G.	19	C. H.	2/14/26	1	225	Pneumococcus	Pneumonia
R. S.	19	C. H.	4/2/26	2	500	Pneumococcus	Pneuomonia
J. P.	46	C. H.	5/11/26	6	2170	———	Influenzal Pneumonia
A. R.	6	H. D.	7/27/26	4	270 and incision	Pneumococcus	Pneumonia
W. M.	48	C. H.	1/8/27	10	7450	———	Pneumonia
J. G.	18	C. H.	1/12/28	10	2025 and incision	Pneumococcus	Pneumonia

DISCUSSION

Dr. E. D. Fenner (New Orleans): This is a very interesting subject. I saw some of Dr. Danna's cases, and the roentgen-ray pictures, and thought I would like to try it in young children. I tried the aspirating needles in these young children, but I could not work it. I could not get them to keep still enough to avoid using my needle like a bayonet. They fought and struggled to such an extent that I was forced to abandon the effort. I had a sort of feeling that it might be possible in somewhat older children, but in those under five or six it is like trying to cure a hernia with a truss. Nobody can keep a truss in position in a child old enough to walk. As soon as your back is turned the child pulls it up to relieve the pressure, and the hernia comes down.

The other day I tried to use closed drainage in one of these children by means of a catheter inserted through a canula. It worked well for a while, but then the patient began to pull the tube out every few hours, and my closed drainage was soon converted into the other sort. I have had the same experience with several other cases, so that I am still forced to rely on rib resection and a flanged tube they cannot pull out.

Dr. N. F. Thiberge (New Orleans): Twenty-five years ago, I had a case that would corroborate Dr. Danna's conclusions here, and it was a case of tubercular pleursy with effusion. I withdrew the fluid and as I was getting through, I applied a good deal of suction to get the fluid out, and just as I was getting through, the needle was disconnected with the suction apparatus and, to my horror, the patient took a deep inspiration and filled up his chest with air. I quickly removed the trocar, expecting the pleura to become infected. He did beautifully, he is still living and is well.

Dr. Danna (closing): There are one or two points I want to call attention to, one is that doing this work is not easy, that it is easy on the patient but it is not easy on the man who does the work, it is very hard work. These four cases that I have on hand now keep me pretty busy, they keep me almost as busy as the rest of my work, because you have to watch them and you have to do the work, yourself, you cannot turn it over to anybody else. So, if you try this work, expecting that it is going to be a cinch, don't do it, because it is hard work and requires very close attention.

We do not use any irrigation in these cases at all. We have merely removed the pus and let nature take care of the rest.

I really would like to see the thing tried out more; this is merely an experiment, if you will, it is something that may work out fine or it may not work out at all.

CLEFT PALATE: WHEN AND HOW SHOULD IT BE TREATED?*

E. D. FENNER, M. D.,

NEW ORLEANS.

For more than thirty years I have been interested in the treatment of cleft palate, and have today under my care a baby whose mother was successfully operated upon by me during her infancy. I have, however, found it impossible to trace the records of cases operated upon prior to 1922. Every case I have seen since 1922 and up to the date of this meeting is included in this study. They are 48 in number, and since I believe it to be a fact that I see and treat a larger number of cases than any other man in this section of the country, this relatively small number of cases indicates that, like other congenital deformities, cleft palate is not as common in Louisiana as in sections where immigration has been very large.

Congenital fissure of the lip and palate originate in very early foetal life-during the embryonal period, before the end of the third month. They are due to a failure on Nature's part to complete the fusion of the lateral branchial arches with the descending frontal, or intermaxillary process. The failure may be unilateral, or bilateral; it may involve only the lip, only the palate, or both. The cleft lip may be partial or complete; the cleft in the palate may involve only the soft palate, it may extend as far forward as the gum, or it may pass completely through the alveolar border, on either one or both sides of the nasal septum.

If we are to understand the rationale of treatment it is necessary to have a clear mental picture of the common varieties of cleft palate seen in practice, namely:

1. *Post alveolar clefts*, divided into:
   (a) Partial, involving the soft palate, or a portion of the hard palate.

*Read before the Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

(b) Complete, extending as far forward as the alveolar border of the upper jaw.

2. *Unilateral peralveolar,* passing through the alveolar process, as well as the soft and hard palate.

3. Bilateral peralveolar, or tripartite, in which the intermaxillary process protrudes like a snout.

In any of these varieties there may be associated cleft lip, which is found in about 80 per cent of cases of cleft palate.

There is unquestionably considerable divergence of opinion amongst men of experience as to when operation should be undertaken in cleft palate. Details in operative technique are likewise the subject of controversy. To attempt to discuss either of these questions, presenting the arguments pro and con of various surgeons, would prolong my paper through hours instead of minutes. I shall, therefore, present to you only my own seqcence and technique.

Much confusion of thought will be avoided if we keep clearly before our minds the fact that there are three important anatomical structures which must be considered independently of each other in these cases, namely: the lip, the alveolar process of the upper jaw, and the roof of the mouth. When we discuss the proper age for operation we should make it perfectly plain which of these structures we are talking about, and this is something that many writers fail to do. They fulminate upon the importance of operating in very early infancy, and when we study their thesis minutely we find they are talking about the closure of a cleft lip, or the reduction of an alveolar gap.

In my own practice I divide the treatment of cleft palate into preliminary procedures, and final operation. Preliminary work includes the closure of a cleft lip, the approximation and wiring of a one-sided alveolar gap, the reduction and wiring of a protruding intermaxillary process. All of this preliminary work should be done in early infancy, before the end of the third month, if possible. How long before the end of the third month depends upon the nutrition and vitality of the child. Every new-born babe has to demonstrate its capacity to survive, and this demonstration is far more doubtful in the cleft palate case than in the normal infant. It seems wise to wait until the infant has shown that it is capable of overcoming this handicap. The dictum that the new-born is immune to shock and other operative dangers is something I have never been able to accept without reservations. The surgeon who accepts the slogan that, "since the new-born is immune to shock, no mother should be permitted to see he rbaby with a cleft lip," is, in my opinion, going to meet with many anxious hours as his cases multiply. This is one of those phrases, like "the self-determination of peoples," "peace without revenge or penalties," which is "full of sound and fury, signifying nothing," at least in the practical management of these cases. Lewis A. Sayre, with the same purpose to startle the attention of his hearers to the necessity of early treatment of club-foot, used to say that it should begin before the extraction of the placenta. But did he, or any other man, ever begin to manipulate a club-foot before the vernix caseosa had been washed off the baby's body? No, gentlemen, these extreme positions are suited only to the exceptionally mild case, and are not sound general practice. So much for the preliminary work.

The ultimate aim of all cleft palate surgery is to restore the roof of the mouth, and to provide an efficient muscular membrane to shut off the naso-pharynx for purposes of deglutition and speech. This is the final operative step. All the preliminary procedures are preparatory, or simply cosmetic. This final operative step should not be undertaken until the end of the second year. Very wide clefts, of the Roman arch type, may wisely be let alone for a year or two longer. Clefts involving

the soft palate only, or complete clefts, which are narrow, and present a steep Gothic arch, might be attacked at eighteen to twenty months. Before the seventeenth month the tissues of the soft palate do not hold sutures well, and it remains the consensus of opinion amongst men of the widest experience that two years is the age of choice for the final operation.

The only operation with which I have any experience is the Langenback-Fergusson procedure. In operating I sit at the head of the table, employing the Rose position, with the head of the table somewhat lowered, and the attitude of the patient accentuated by a small cushion under its shoulders. The operative field is exposed by a Whitehead mouth gag, without tongue piece. The tongue is controlled by a suture through its tip, and a depressor, fashioned from a Parker retractor by nearly straightening one end, permits the assistant to hold the tongue out of the way when necessary. The suction apparatus, and etherization through a nasal catheter, greatly facilitate the work. Bleeding is controlled by sponge pressure, and time so spent need not be grudged. The very efficiency of the suction may obscure one's appreciation of the extent of the hemorrhage.

First on one side, and then on the other, lateral incisions are carried through the soft parts just inside the last molar teeth, and slightly prolonged backward and outward around them. I keep these as small as possible, seldom more than ½ to ¾ inch long. Suitably shaped elevators are introduced through these incisions, and the whole muco-periosteum is lifted away from the hard palate as far backward as the posterior edge, and as far forward as the anterior extremity of the cleft. The point of the elevator is brought out through the margin of the cleft.

The next step is the liberation of the aponeurotic attachment of the soft palate to the hard. This is accomplished by insinuating one blade of a pair of curved scissors beneath the flap you have raised, while the other lies free in the nasopharynx, and then cutting outwards till the whole attachment is freed.

Next comes the paring of the edges of the flaps. A tenaculum is inserted into the edge of the cleft at the junction of the soft and hard palate to steady it, and with a very sharp narrow knife (a Von Graefe cataract knife is admirable) a strip is taken away the whole length of the cleft. One should be sure that no islands of epithelium have been left along the edges to interfere with union, and enough tissue should be cut away to ensure broad raw surfaces for approximation.

Having made sure that no islands of epithelium have been left along the edges of the cleft, the flaps are sutured. The stitches are passed through and through the flaps, close together, from the tip of the uvula to the anterior extremity of the cleft. Black silk, fine black silkworm gut, or "dermal" sutures may be used according to the fancy of the operator, and they may be simple, mattress, or "end-on-mattress." The only thing that is important is that the flaps should have been sufficiently freed to permit the sutures to be tied without any tension. If they have to be dragged upon, the cleft will certainly break down. As a rule I carry three or four sutures of black silk along the nasal side of the soft palate, and finish off by introducing one of two heavy "tension" sutures deeply through the soft palate to restrain the action of the muscles. This completes the operation, except for the introduction of a light packing of iodoform gauze into the lateral incisions.

After treatment consists largely in letting the child alone, except for feeding with liquids, and following each feeding by plenty of cool water to wash off the buccal surfaces. Argyrol instillations into the nostrils, and, in older patients, bland alkaline mouth washes may be given. While I am convinced that a lot of non-

sense has been written about the devastating effects of crying, there is certainly little to be gained by precipitating a struggle with a terrified child in order to perform a surgical toilet of the mouth.

The danger period to the line of sutures is from the fifth to the eighth day, and threatened breakdown is announced by the appearance of mucous, thick and tenacious, about the sutures. Soon afterwards some gaping will be noticed somewhere along the line, usually at the junction of the hard and soft palate, and frequently at the anterior extremity of the cleft. The break may be confined to a small area, or it may involve the whole line. Moderate sized openings often close of themselves if given time, or a secondary plastic may be necessary to complete the anatomical cure.

Failure is due to three factors: (a) Impairment of the circulation by too extensive lateral incision, and brutal handling of the flaps; (b) infection; (c) tension on the sutures. The latter is, in my opinion, by far the most potent cause of failure. As shown in two of my cases, even a violent post-operative diphtheria may occur without interfering with perfect healing of the cleft.

A good many writers claim to be able to lift the flaps without injuring the palatine artery. Personally, I do not see how this can be done. Certainly in many cases the artery has been torn without preventing perfect union. Where moderate sized openings persist, their healing may be assisted by stimulation with nitrate of silver, or in older patients, by putting in a light vulcanite plate to cover the roof of the mouth.

Failure of a cleft palate operation is a surgical disaster, because the abundant scar tissue makes a secondary operation much more difficult and uncertain. The closure of the soft palate is more important to the patient than union of the hard palate. A dental plate can readily be fitted to occlude a hole in the hard palate, but no really efficient obturator has been devised for an open soft palate.

The chief aim of cleft palate surgery is to enable the patient to speak clearly and intelligibly, and statistics upon this functional result are exceedingly difficult to obtain. There can be no doubt that perfect speech is found in only a small percentage of cases. It must be admitted, however, that to restore the alveolar arch, to close off the mouth from the nose, and to give the patient a comely mouth, is to have done much to deserve the gratitude of both parents and patient, even though speech remains defective.

Cleft palate surgery is not easy. The pathway to a technique that yields 70-75 per cent of anatomical successes, and an additional 20 per cent in whom only small openings persist, is strewn with failures. The ordinary training of even a highly competent general surgeon offers little security. The "occasional" operator is doomed to disappointment, and his inevitable failure reduces very greatly his patient's chances of ultimate cure. He who has the opportunity to see a succession of cases, and who has determined to perfect himself in the work, may solace himself by the reflection that he may surmount the difficulties by practice, but he who expects to operate only once in two or three years jeopardizes the future of his patient without the consolation of feeling that later patients may profit.

In this connection a quotation from a very elaborate and splendidly written article on cleft palate, by Francis W. Goyder, in the British Journal of Surgery, Vol. 1, No. 2, is very apposite. He says: "It seems also, that a special interest, and perhaps a special capacity, is required to make an otherwise excellent surgeon into a successful operator in cases of cleft palate. Certainly experience, not of surgery in general, but of these operations in particular, is essential. . . .Many improvements have been introduced into the oper-

ation, but those which have survived have been rather simplifications than elaborations of the original method. Most of them have been devised to get rid of tension in the sutured edges; but the more experience a man gets, the smaller his lateral incisions become; he gets rid of tension in other ways. But let the beginner try to avoid long lateral cuts, and his sutured clefts will not long remain closed.

In conclusion, let me confess that I have been able to touch but lightly upon the varied problems of cleft palate surgery. I have given my own convictions as to the time sequence and operative technique, but I realize that there are many who would take issue with some of the views herein expressed. But in this work a man must adopt an operative plan, and practice it until he can be reasonably sure of a favorable result.

DISCUSSION.

Dr. Fuchs (New Orleans): I just want to say a word about cleft palates. As an ear, nose and throat man, we see quite a number of them. I was fortunate enough to see several cases Dr. Fenner operated on, later taking out the tonsils, and the results were excellent. I do not know whether he picked out the excellent ones and sent them for tonsillectomy or not.

Dr. Fenner spoke about the sutures coming out. I think I mentioned to him, some time ago, about seeing some patients in Manhattan, whom Dr. McKenty operated on, and he used the little stunt that appeared to me very good. In order to protect the suture, he has a metal disc and he places that over the suture and ties it with a lead band extending from one lateral incision to the other. He said that in most of the cases loosening of the sutures were due to the tongue rubbing on the suture line and loosening it, and with that plate protecting it, there was no chance for the tongue to loosen it up. That may be just a little point.

Dr. Lorio (Baton Rouge): I would like to ask Dr. Fenner to discuss, for a moment, the end results of cases as far as speech is concerned, especially in these cases that he has had a complete closure of the palate. I have had two or three cases in my own family that have been operated on, some as many as two, three, four times, I think my sister was operated on six different times, one of my brothers was operated on for a cleft completely closed, but it seems the soft palate does not always function well, even after you get a closure of the palate there is still a nasal inclination, and to overcome that, I notice most of these patients have a peculiar expression of the face, the larynx seems to be in constant motion, trying to close during conversation, in order to cut off the air. I do not quite understand that, because if the palate is all closed, I do not see why the patient would want to constantly close the larynx in order to speak intelligently and plainly. I would like to ask if you can explain that for me, please.

Dr. E. D. Fenner (closing): I cut out a good deal I might have said out of respect for the time limit. This question of the speech is, of course, tremendously important. It is unfortunately true that, even where you have gotten an anatomical success speech remains defective in many cases. If the operation is delayed till the patient is eight, or ten, or fifteen years of age, you never get any improvement in the speech. Clear articulation and good speech depend upon a functionally good soft palate. It must be flexible. It must be sufficiently long to lie against the posterior pharyngeal wall, and cut off the naso-pharynx completely. Owing to the very nature of the deformity, one of the inevitable tendencies of the operation itself is to shorten the palate somewhat. In addition, the cutting of the attachment of the soft to the hard palate, and the other steps of the operation, results in the formation of a good deal of scar tissue, with the result that the palate loses some of its flexibility.

In a considerable number of cases, while the major part of the palate is closed, there remains a hole at the junction of the hard and soft palate. This hole will frequently close of itself in a few months, but in the process there is contraction of the tissues which tends to draw the soft palate forwards, and shorten it a little more.

In reference to that perforated plate, we all know that in older patients who have been left with a small hole in the palate if we can get a dentist to make a plate to fit over the roof of the mouth the hole will generally close. Dr. Bunnell, of San Francisco, is not a pioneer in this suggestion. A surgeon in New York, whose name I cannot recall at the moment, was using such a plate in young infants a number of years ago. He sutured it to the gum so as to keep it in place, and claimed that it was of great value in protecting the palate. I did not say anything about the plate because I have not had a chance to try it. I had no one to make one for me, and could not afford the expense. My own experience has been that where I could bring the flaps in contact without tension, and did not bruise the tissues too much, I got success. Where I had tension I got failure.

TULAREMIA, REVIEW OF LITERATURE WITH REPORT OF CASES.*

W. S. KERLIN, M. D.,

SHREVEPORT, LA.

Tularemia is an infectious disease caused by the bacterium tularense. Primarily it occurs in nature as a fatal bacteriemia of rodents, especially rabbits and hares. Secondarily it is a disease of man, transmitted by the bite of an infected blood sucking fly or tick, or by contamination of his hands or his conjunctival sac with portions of the internal organs, or with the body fluids of infected rodents, flies or ticks.

Cases have been reported from thirty-nine states of the Union and the District of Columbia. Ground squirrels, wild rabbits and hares, wild rats and mice have been found infected in nature.

Transmission to man occurs (1) by the bite of the horse fly, (2) wood tick, (3) tick (species undetermined), (4) contamination of his hands or conjunctival sac with infected organs or body fluids of infected rabbits, flies or ticks, the last mentioned being the most common cause, therefore most cases occur in market men, hunters and housewives, as a result of cleaning rabbits.

Laboratory workers become infected by performing or assisting at necropsies of infected guinea pigs, rabbits or white mice, or by handling infected ticks.

Bacterium tularense is a small pleomorphic organism, gram negative, non-motile and non-spore bearing, and grows only under anaerobic conditions.

There is a bacteriemia early in the disease as cultures of the organism can be isolated from the blood of man during the first week. No instance has been reported of the spread of the infection from man to man by mere contact or by the bite of an insect which has previously bitten a patient. The disease is essentially of a subacute and chronic character in man. This applies to the lesions as a whole. Pathologists unfamiliar with the lesions in man are likely to mistake it for tuberculosis. The granulomatous character of the lesion is very noticeable. Four clinical types are usually noted. (1) Ulcero-glandular, the primary lesion being a papule, later an ulcer, and accompanied by an enlargement of the regional lymph glands. (2) Oculo-glandular, the primary lesion being a conjunctivitis with enlargement of the regional lymph nodes. (3) Glandular without primary lesion but with enlargement of the regional lymph glands. (4) Typhoidal without primary lesion and without glandular enlargement.

The average incubation period is about three days. The onset is usually sudden with a chill, headache, profound prostration, generalized body pain, sweating and fever. The fever usually lasts from two to three weeks. The white cell count is usually moderately increased. A very definite skin eruption is noted in some cases being macular, papular, or pustular.

Convalescence is slow; it is unusual for a patient to be at work again at the end of a month. Frequently they are not even able to work the second or third month. Some have not entirely returned to normal for six months to a year. Suppuration of lymph glands has been noted ten, twenty-two and twenty-four months after onset of disease. This happened in the first of the following cases to be reported; the inguinal glands suppurating two years after the original infection. Recurring mild attacks of fever have been noted. Of five hundred and sixty-five reported cases to date, twenty terminated in death.

Because tularemia is not borne in mind it is erroneously diagnosed "flu," dengue fever, septic infection, typhoid fever and sporotrichosis. The following points should be borne in mind when making a diagnosis of tularemia. (1) A history of having dressed a rabbit, or being tick or fly bitten.

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(2) A primary lesion of the skin in the form of a papule, followed by a persistent ulcer. (3) Persistent regional glandular enlargement. (4) Fever from two to three weeks duration. The diagnosis is proven by obtaining an agglutination of the patient's serum with bacterium tularense. A study of the blood serum of two hundred and eighty-nine cases of tularemia by Francis, tested for agglutination of bacterium tularense, showed a complete absence of agglutinins in the first week of illness, the constant presence in the second week, an abrupt rise in the third week reaching its maximum in the fourth, fifth, sixth or seventh week, a fall in titer in the eighth week; a gradual decline thereafter; persistence of agglutinins in long recovered cases; and the failure of agglutinins to entirely disappear in any case, even 10, 14 and 18 years after recovery. One attack confers immunity in man.

Unique features are (1) the certainty of infection of laboratory workers, (2) the persistence of agglutinins in the blood of long recovered cases, (3) the granulomatous character of the lesions in man as contrasted with the lesions in animals, (4) the great variety of insect and animal hosts.

The treatment is symptomatic. No preventive vaccine or curative serum has been perfected. Four cases of the ulceroglandular type occurring in Louisiana are reported.

Case No. 1. E. T., white male, aged 39 years, of Bossier Parish. Admitted to the Schumpert Sanitarium on August 7, 1923, complaining of generalized pain over body, severe prostration and fever. The onset of his illness was sudden fifteen days prior to admission to the hospital, with rigors, severe headache, pain in back and legs with high fever. After the above symptoms had persisted for five days, a red macular eruption appeared over practically the entire body. Within three days the eruption was vesicular, then pustular; fading in about ten days but still noticeable on admission to the hospital. He was treated before admission for dengue fever. Coincident with the onset of symptoms a large wood tick was discovered by the patient on the left shoulder surrounded by an area of intensive inflammation, the size of a half dollar. This area sloughed out, leaving a punched-out ulcer, which healed in about three weeks and on healing left a scar. The glands in the left axilla became inflamed and tender about this time and suppurated within from six to ten days, draining for about three weeks. He ran an irregular daily fever for twenty-eight days. There was a moderate leukocytosis; a negative Wassermann, typhoid and para typhoid reaction. Up until the onset of the present complaint he had always enjoyed excellent health. A diagnosis of tick fever (Rocky Mountain Spotted Fever) was made as the symptoms fitted in fairly well. Convalescence was very slow; he lost fifty pounds in three months time but was partially able to resume his work within a period of six months. Attacks of low grade fever recurred at intervals thereafter, and in July, 1925, his left inguinal glands suppurated without any apparent cause. During a period of about three years he consulted several doctors, hoping to obtain relief from his extreme weakness. In January, 1927, he consulted us again when it was thought that he might have tularemia. The blood serum a few days later agglutinated bacterium tularense in dilutions of 1:10, 20, 40, and 80. For the next three months a chronic abdominal pain became aggravated and on April 30, 1927, he was admitted to the hospital and within twenty-four hours definite symptoms of intestinal obstructions appeared. On opening the abdomen every six to eight inches of the small intestine was found to be surrounded with a granulomatous mass, rather firm and malignant in appearance and constricting the lumen. The mensenteric glands were moderately involved. Due to the extensive involvement and the character of inflammation, no further operative interference was attempted. Excised gland revealed only a granulomatous type inflammation. Strange to relate, his post operative recovery was uneventful, and except for a few abdominal flareups, his health continued as before operation. A few months later he visited the Mayo Clinic. A report from them was to the effect that radiologically his gastro-intestinal tract was entirely negative and that his blood serum agglutinated bacterium tularense in a dilution of 1:160. In February of this year he was re-admitted to the hospital with rather severe abdominal pain but after several days on a liquid diet his symptoms subsided. His blood serum at this time agglutinized bacterium tularense in dilutions of 1:10, 20, 40 and 80.

Case No. 2. Through the courtesy of Doctor W. M. McBride, I am privileged to report the following case.

Mr. H. of Jackson Parish removed a tick from the left leg on April 5, 1927. He called Dr. McBride on April 10, complaining of having had a rigor followed by high fever, prostration and

generalized body pains. The above symptoms came on very suddenly and continued rather severe for three days. For the next three weeks his fever varied from 99 to 103 degrees. During this time the tick bite, at first insignificant, gradually developed into a circular punched-out sloughing lesion nearly the size of a dollar. The left inguinal glands became inflamed and tender soon after the onset of symptoms and were on the verge of suppurating on one occasion. Several days after onset an indurated bluish macular eruption appeared in the region of the left groin, a few scattered ones also being observed over the remainder of the body. The eruption faded after the fifth day. At the end of one month the ulcer was slowly healing but was far from well. Blood serum on May 10 agglutinated bacterium tularense in dilutions of 1:10, 20, 40, 80 and 160.

There was considerable weight lost for the first three weeks.

Case No. 3. 183838—Mrs. McC., white, female, of Jackson Parish, age 30 years. Admitted to outpatient department of the Charity Hospital, Shreveport, Louisiana, August 20, 1927, with the history that she had been bitten by a tick on the left leg in February, 1927, causing her to remain in bed six weeks. Prominent symptoms at the onset were fever, prostration, and severe pain in the left leg, with marked swelling of the regional lymph glands. These glands suppurated and were incised early in the course of the disease. She had been very weak since the tick bite, with the loss of thirty-five pounds in weight. Examination at the clinic revealed a small healed ulcer, bluish in color on the calf of the left leg. There were also several small scars along the inner aspect of the left thigh and inguinal region. The urine analysis and blood Wassermann were negative. Blood serum agglutinated bacterium tularense in a dilution of 1:80. The patient stated that at the time of her illness she noticed many sick rabbits around her place. She was able to resume part of her work within three months. A letter from her the past month was to the effect that she was able to resume her usual work within eight months, but that she had not entirely regained her strength.

Case No. 4. M. D., of Webster Parish, colored, male, age 60 years. While hunting in the swamps during the first week of October, 1927, he was seized with a chill, followed by fever and pain in his right shoulder and axilla. On returning home he discovered a small bluish red papule beneath the right clavicle. He was very sick that night with high fever and prostration. The next morning the right axillary glands were swollen and tender. He remained in bed two weeks with fever, pain in right shoulder and arm and extreme weakness. During this time his hands and feet burned and pained him considerably. The skin of palms and soles also peeled off in large scales. Examination on October 14, 1927, (about two weeks after onset of illness) revealed a small punched-out ulcer with undermining edges beneath the right clavicle. The right axillary glands were swollen and tender. The skin of the palms and soles was peeling off. He complained of neuritic pain in the right chest, shoulder and arm and weakness. His temperature was 101 degrees, the leukocyte count was 12,500; the differential count was within normal limits; the blood Wassermann and urine analysis were negative. He returned one week later on account of suppurating right axillary glands, persistent fever and pain in shoulder and arm. The glands discharged for two weeks and on healing left a scar. The ulcer healed in about three weeks and likewise left a scar. In response to a letter several days past he returned for further questioning. He stated that he had been unable to resume work in any form on account of weakness and soreness over the body. He still complained of darting pains in the right chest, shoulder and arm. His feet and hands still tingled and burned. Fever had recurred at irregular intervals on his attempting to work. He lost thirty-five pounds during the first month of his illness, regained several pounds but has lost again recently. His blood serum agglutinated bacterium tularense in a dilution of 1:160.

SUMMARY.

(1) Four cases of the ulcero-glandular type of tularemia are reported as occurring in Louisiana.

(2) Cases 1, 3, and 4, were unable to resume even a part of their work under six months. Case 1, at the end of five years is able to perform part of his work.

(3) There was considerable loss in weight and extreme weakness in all four cases.

(4) The source of infection in three cases was from the bite of a tick (species undetermined). Case 4 remains undetermined but presumably caused by the bite of a fly or tick.

CONCLUSIONS.

Tularemia is evidently more prevalent in Louisiana than has been realized in the past. This brief review of the literature with the report of four cases is presented with the hope of stimulating further interest and closer observation with the view

of more frequent recognition of this comparatively new and interesting disease.

Note: All agglutination tests were made by Doctor Edward Francis of the U. S. P. H. S., Washington, D. C.

E. T., case No. 1, expired in January, 1929 after a lingering illness of 6 months duration. The principal symptoms consisted of an intractable diarrhea, frequent bulky, light colored stools, strongly acid in reaction, fatty acid crystals, many fat globules and starch cells. He had frequent attacks of abdominal pain. Weakness and loss in weight were pronounced. The above symptoms are fairly typical of a chronic pancreatitis. An autopsy was not obtained.

DISCUSSION.

Dr. W. P. Butler (Shreveport): I think, undoubtedly, we have been missing some of these cases, due to the relative infrequency of it, or to the fact that we simply have not been on the lookout for it, not being informed until the last two years. As the time is short, I will not take up any of your time to discuss the bacteriological or seriological aspects, though we have been doing a little of that in Shreveport.

There is one case which Dr. Kerlin reported under the name of Taylor's case, Number One, that, had it not been for the previous warning that we had, the pathological report would possibly have been different. This was a case that was operated on with a rather extensive involvement in the abdomen, and one of the mesentery nodes was sent to the laboratory for diagnosis.

As we know, there is nothing characteristic or specific in the pathology of this condition, particularly in a secondary node, but we did find we were able to eliminate tuberculosis or any form of malignancy, or the possibility of its being secondary to some intestinal parasites, and the presence of tularemia made us suspect this condition. These slides were sent to Dr. Ewing's laboratory at Cornell, and a report from him verified at least the suspicion, as we know we cannot make a positive diagnosis.

I wish to repeat, not to take up any more time, that I believe we should be more on the lookout for this condition, because we are undoubtedly missing some of these cases thinking they are possibly of a tubercular nature. I thank you.

Dr. Foster Johns (New Orleans): I think that Dr. Kerlin's contribution is quite timely. I know that tularemia is gradually spreading over Louisiana. I have been on the lookout for it practically ever since Francis described the infection in Montana, and while I have had several suspicious cases, it was only a few weeks ago that I was able to definitely find a case occurring in the environs of New Orleans. This was a case seen in consultation with Dr. Murphy, of Garryville, and which gave a very high agglutination for Bacillus tularensis when the blood serum was tested by the Public Health Service in Washington.

I believe that we are going to see a great deal of tularemia throughout Louisiana and I believe that steps should be taken through the Isaak Walton League and through other means to warn the populace about this danger.

I also had the pleasure of seeing Dr. Kerlin's patient several months after the initial lesion occurred on his finger and during this time, from the history particularly, it did seem that the diagnosis of Rocky Mountain spotted tick fever was the correct one. He was a very sick man at the time and with all of the available laboratory data that I could gather I could come to no definite conclusion regarding the etiology of his pathologic process.

I wish to congratulate Dr. Kerlin for continuing to study this case and finally arriving at the accurate diagnosis of tularemia.

Dr. N. M. Collins (Hosston): I will not take up any of your time on this, except to thank Dr. Kerlin for including the report of my case in his paper. This particular negro whom I saw, I want to impress upon you that when I first saw him, after he had been sick five or six days, was a very, very sick man, he was almost in a dying condition; but, for some reason or other, he had a gradual improvement. He was weak and emaciated for a long time. He is now gaining strength and weight, slowly.

Another thing, I made inquiry around in that section of the country, and I found that the rabbits are dying by numbers this year. One negro told me that he found five dead rabbits in one pile, so probably tularemia will kill out the rabbits and we will get rid of tularemia.

Dr. W. S. Kerlin (Shreveport, closing): I have but a very few remarks to add, in closing. Just a few days ago, I received a communication from Dr. Francis in which he states that tick bite is a source of infection in the Southern States, which is receiving much recognition. The record for these cases now stands in the Southern states: Louisiana, eight cases; Arkansas, six cases; Tennessee, six cases; Texas, two cases; Oklahoma, two cases; total of twenty-four. The species of Southern tick is still undetermined, because nobody has caught a tick on a man in actual transmission and forwarded it for identification. It is through Doctor Francis' untiring efforts that tularemia is being so universally recognized.

A CONSIDERATION OF THE SEDIMENTATION RATE OF ERYTHROCYTES.*

E. H. LAWSON, M. D.,

NEW ORLEANS.

For the past several years quite a bit of attention has been directed toward the sedimentation rate of erythrocytes, not only in the establishment of a uniform and simple technic, but in its application in various diseases with regard to its prognostic value. The estimation is by no means a new procedure, but dates back to the time of Galen, who first noticed that in cases of infection the settling of the erythrocytes was more rapid than in the blood of normal individuals. Later, such men as John Hunter, Virchow and others noted the same phenomenon. "The clear yellowish serum that was left by the sinking away of the red cells was called the 'crusta inflammatoria' or 'crusta phlogistica,' and was regarded as an exceedingly important sign. The color, thickness, and consistency of the crusta inflammatoria were considered significant in the diagnosis, treatment, and prognosis of the disease. As the practice of bleeding patients fell into disrepute, the sedimentation of the blood cells and the crusta inflammatoria were forgotten." Biernackie in 1897 reported seventy-five cases in which the sedimentation test had been performed. At this time he thought this this test might have some value. In 1917, Fahreaus rediscovered the phenomenon and perfected a techhnique for the estimation of the serimentation rate of erythrocytes. His technique consisted of mixing 8 cc. of human blood with 2 cc. of 5 per cent sodium citrate solution, and noting the time for the complete sedimentation of erythrocytes. Many variations in this technic have been made in the more recent investigations, such as the modification of the percentage of the sodium citrate solution used and the type of tube employed. For instance: Peyre used an isotonic or 3½ per cent sodium citrate solution. Westergren substituted 3.8 per cent sodium citrate. Zechner and Goodell used 3 per cent sodium citrate and employed an ordinary centrifuge tube graduated in .1 cc. intervals, recording the height of the red cells after one hour. Linzenmeier, in his first work on the subject, used glass capillaries 1 mm. in diameter, bearing several marks to measure the proper ratio of blood and sodium citrate, and took a record of the time required for the height of the plasma to reach the 18 mm. mark. He later developed a technic, using tubes 5 mm. in diameter and 6½ cm. in length, having a capacity of more than 1 cc., and marked at the 1 cc. and 18 mm. point. The technic was to, first, draw up .2 cc. of a 5 per cent solution of sodium citrate into a syringe and .8 cc. of blood taken from a vein in the arm. After mixing the blood and citrate, the solution was transferred to the tube until the marginal level reached the 1 cc. mark. The time was then noticed when the plasma volume reached the 18 mm. mark and the readings were then recorded in minutes. Friedlaender has modified the Linzenmeier tube by adding the graduations at the six, twelve, and twenty-four mm. mark.

Morriss and Rubin used 1 cc. serological pipettes graduated in hundredths, a dilution of one part 3.8 per cent sodium citrate and four parts of blood, and took their readings at the end of one, two and twenty-four hours.

Cooper used 20 per cent potassium oxalate for his anticoagulant.

Recently, Hunt, using an ordinary 5 cc. syringe, mixed 3.5 cc. of blood with .5 cc. of 1.6 per cent of sodium citrate and placed 1 cc. of the mixture in a 1 cc. pipette graduated in hundredths, noting the drop at periods of one hour and two hours, applying the term sedimentation index to the curve plotted when the volume of plasma is the abscissa and the time required in minutes as the ordinates.

*Read before the Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

Concurrent with the development of an accepted technique have been investigations to determine the etiologic factor in blood sedimentation.

Gram found that the amount of fibrinogen increased with a more rapid sedimentation rate.

Fahraeus and Hober decided that the increase in agglutination of the erythrocytes was primarily due to a change in the electric tension between negatively charged erythrocytes and positively charged bodies in the plasma.

Smiley explains the increase in the rate as due to an increase in the fibrogen and globulin with a relative decrease in the albumin content of the plasma. The above factors, hence, give an increase in the viscosity and diminution in surface tension of the plasma and in the erythrocytes, a diminution in the negative electrical charge with a change in the surface tension and an increase in the viscosity. He also noted that the temperature affected the rate as he found that the sedimentation rate was more rapid at incubator temperature than at room temperature.

Cooper found that as the cholesterol contents of the blood increase, the sedimentation rate becomes more rapid. He also found that defibrinated blood gives a slower rate after defibrination than previously.

Rubin explained the rapidity of the rate as due to tissue destruction, and that the bacterial toxins, products of protein catabolism and inflammatory products accelerate the rate; therefore, the more acute the condition, the more rapid the rate; the less virulent and numerous the bacteria, the less variation of the rate from normal.

The value of the sedimentation rate of erythrocytes has been recognized in the diagnosis and prognosis of many conditions. For instance, Lohr and Pohle used this method as an aid to differentiate between carcinoma of the stomach and peptic ulcers of the stomach. They found that in 50 per cent of carcinomas of stomach, the sedimentation rate was increased, while in only 10 per cent of the peptic ulcers such an increase was shown. In the differential diagnoses of diseases of the adnexa, ectopic gestation, and other masses found in the pelvis, the sedimentation rate has been very valuable, the rate being increased in acute pelvic infections, while in some of the other pelvic masses, the rate is normal. This technic is also employed as an indication to the most appropriate time for operation in acute pelvic infections, as the more acute the condition, the more rapid the rate and the more grave the prognosis, when surgical intervention is used at this time. Polak has advised the use of the sedimentation rate as an indication of the time to operate on pelvic infections and has found that following a pelvic operation, a low sedimentation rate is an early index of a beginning peritonitis or perimetritis. Baer and Reis, using the Linzenmeier-Friedlaender technic found that with an increase in the activity in the pathology present, there is found a corresponding decreased sedimentation time. For example,ovarian cyst showed a sedimentation time of 112 minutes; chronic salpingitis, 91 minutes; subacute salpingitis, 53 minutes; acute salpingitis, 28 minutes. They also found that a continued rapid sedimentation time seems to denote a greater virulence of the infecting organism or lowered resistance of the patient; therefore, a corresponding protracted period of illness, and that a comparison of the post-operative course of the cases with varying degrees of infection, would indicate that an operation should be delayed and not attempted on patients showing a sedimentation time under 115 minutes.

The velocity of the sedimentation rate in cases of pulmonary tuberculosis is directly proportionate to the activity of the disease, for the greater the extension of the tuberculosis the higher the sedimentation rate. However, according to Sed-

linger, a normal sedimentation rate does not exclude an active tubercular process.

Typhoid fever shows an interesting variation in the rapidity of the rate during the course of the fever. The rate at first is slow, then gradually increases until the third week, after which it remains high for some time, even after the temperature is normal. Such is the finding of Gerecke.

Culmeyer found a high sedimentation rate in an acute rheumatic polyarthritis, which was directly proportionate to the clinical symptoms, as this high rate fell with the retrogression of the symptoms. Some of the other conditions which the sedimentation rate has been used for as an aid in the diagnosis is late pregnancy, syphilis, and most of the acute inflammatory conditions.

Personal experience with this laboratory method has borne out several of the above observations. For instance, in twelve cases of pulmonary tuberculosis, in conjunction with Dr. R. H. Potts, the sedimentation rate was found directly proportionate to the activity of the disease.

In acute pelvic infections, Dr. T. B. Sellers and the author has found the sedimentation rate to be increased. Using the Cutler technic, the curve shows a sudden drop or a complete sedimentation of the erythrocytes within twenty-five to thirty minutes, and, using the Friedlaender modification of the Linzenmeier method, the sedimentation rate has been found to range from eighteen to forty-five minutes. Also, in acute infections, such as acute appendicitis, the sedimentation rate which was high before operation, and read between twenty and forty-five minutes before operation, showed a mcch slower rate for several days following operation, as the patient began to improve. In these cases, the rate of sedimentation coincided and fell with the leukocyte count. However, there are some cases of acute inflammation which show a decrease in the leukocyte count, but which still show a high velocity of the sedimentation rate. Such cases as these are considered by Polak as poor surgical risks.

In conclusion, I might say that the technique of the sedimentation test, using the Cutler or the Friedlender modification of the Linzenmeier technic, is simple and requires very little time; that no definite and concise explanation of the test has yet been found; that the sedimentation rate is of diagnostic and prognostic value when considered in conjunction with other laboratory findings and the clinical symptoms; and that it is of some aid to the surgeon in deciding when to operate infectious cases.

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DISCUSSION.

Dr. T. B. Sellers (New Orleans): Dr. Lawson has just presented to you one of the most valuable diagnostic and prognostic laboratory tests for the presence of infection. One man has stated that the sedimentation test is as accurate as the clinical thermometer. The sedimentation test should not replace blood-counting. For the past several months we have run the sedimentation test routinely in all of our suspected and recognized pelvic infection cases and our findings have tallied with the reports of Drs. Polak and Black. It is of value in differentiating ovarian cyst, ectopic pregnancy, and pelvic infection. The sedimentation time in ovarian cyst or ectopic pregnancy is

prolonged or normal, while in pelvic infection it is reduced. Polak and Black state that in cases of pelvic infection the abdomen should not be opened if the sedimentation time is less than one hour, even if tenderness has markedly diminished, and the temperature, blood count and pulse have been normal for weeks. After twelve years of experience at Charity Hospital in handling pelvic infection cases, I realize that we cannot depend on the temperature, blood count and subjective signs and symptoms, as a small percentage of these cases will run an absolutely normal temperature and normal blood count, and still, at operation, will show a sub-acute condition. I believe the sedimentation test will greatly benefit this class of patients.

Dr. A. Jacobs (New Orleans): I want to thank Dr. Lawson for the privilege he has extended to me to discuss this interesting phenomenon. Since it is really the only blood symptom that has been known on the stage of medical research until Virchow's new theory of cellular pathology. It has caused a great deal of speculation as to its causation.

There are several theories, (a) that there is a diminution or or loss in the electrical charge of the red blood cells, (normally they are charged negative). In certain diseases the electrical charge being deminished or lost the rbc have a tendency to agglutinate and sink rapidly.

(b) Plaut explains this phenomienon by an increased fibrogen in the plasm.

(c) Sacks claims that it is due to a variation in the stability of the collods of the plasm.

Anyone of these theories or all three might correct. I became very interested in applying this test in the disease of the female pelvis. As a diagnostic test, I found it of a very limited value. Only insofar as differentiating between our inflammatory disease or a solid tumor; of the pelvis for instance, a non-infective or non-disintegrating fibroid and an acute inflammatory disease of the aexae. In a solid tumor, barring all other foci of infection, there is slow sedimentation of the test, whereas, in an inflammatory disease, it is rapid, and proportionally so the degree of infection. However, as a prognostic test, particularly determining the safe time for operation, it is of inestimable value.

I have used this test for the last four years in my service at the Charity Hospital and also in my private practice, and, although it might sound to you ambigious, but since I have used the test and have observed the advice of those workers who have particularly emphasized that no abdomen should be operated in a case of inflammatory disease of the pelvis until the sedimentation rate is at least two hours or more, I have not had one single mortality.

I want to emphasize that that does not include, for instance, cases of emergency or barring certain unforseen accidents. I am speaking in truly elective cases. There is no reason why in elective cases one should rush and open an abdomen.

We all know that Crossen, Müller and others have stated that—even in quiescent cases as long as three or four years—by opening an abdomen, one can stir up and cause a flare up of an old infection and patients die of a streptococci infection. Various gynecologists have differed concerning the time of a safe operability. Cherry of Harlem Hospital operates his cases when the leukocytic count is about sixteen thousand, and an afebrile period of three to five days. In a series of cases recently reported he states that he has had a mortality of a little over 4 percent.

I say a mortality of 4 percent in inflammatory diseases of the pelvis, elective operation, is too high a mortality. I just want to cite one or two cases, to show to you the value of this test. For instance, we have a young lady who had a bilateral salpingitis. She was rested about three weeks, with a normal leukocytes count, and without a rise in temperature after two bi-manual examinations, still the sedimentation test was about thirty minutes.

We made a thorough survey of the patient and could not find anything to account for the rapid sedimentation, until one day she complained of a soreness in the gum, and roentgen-ray picture showed an abscess of the first bi-cuspid and incisor. About the third day after the removal of these infected teeth the sedimentation test from thirty minutes it became about sixty minutes, and six days later one hundred and twenty-five minutes. We have operated that young lady and she has not had the slightest disturbance.

I have used the Friedlander test. In find it very practical, very easy to do. In conclusion, I want to urge upon the profession to make free use of this valuable test, practically as an aid to other methods. General physical and local examinations and other laboratory tests in order to determine the safe time of operation in inflammatory diseases of the pelvis.

Dr. J. H. Musser (New Orleans): Last summer I had the opportunity to talk to Dr. Gram, who has made some twenty-five or thirty thousand of these tests and he told me much as follows: He said that we do not know the "why and the wherefore" of the test; we do know, however, that if the sedimentation time has diminished, there is something wrong with the patient; he is speaking

as a internist. "Of course, therefore," he said, "I have found the test of greatest value in determining the individual, who really has something wrong with him, and differentiating them from the individual who is primarily a neurotic." If that is the case the tests will be of immense value, I assure you.

Dr. Foster Johns (New Orleans): May I add to this discussion, "In so far as you have a syphilitic manifestation." In uncomplicated syphilis of all types there is a normal sedimentation rate.

Dr. Joseph Cohen (New Orleans): Dr. E. Reed in one of the German periodicals reported forty cases of cervical carcinoma in which he did some blood work, and he found an increase in the sedimentation rate in almost one hundred per cent of the cases, and went on to add that after repeated tests on the sedimentation rate, if repeated tests proved to be normal, you could almost rule our carcinoma. I want to offer that for what it is worth.

Dr. E. H. Lawson: In closing, I wish to say that syphilitic and tuberculous cases which have been operated, show a sedimentation rate which is slower in recovering to normal than it is in operative cases which have not syphilis or tuberculosis. In anemias, Hubbard of the Pacific Coast has found that in both the primary and secondary type, there is a more rapid sedimentation rate than in the normal individual and has found a more rapid rate in artificially produced anemias.

HYSTERICAL HICCOUGHS WITH ASSOCIATED PHENOMENA.*

WALTER J. OTIS, M. D.,

NEW ORLEANS

Pithiatism or hysteria like Proteus has been called the champion imitator. Violent emotions obviously prepare the soil and create a predisposition for hysterical manifestations. They increase suggestibility at the expense of the critical sense and by occasionally producing actual states of slight mental comparison.

Hiccough or hiccup consists of a clonic contraction of the diaphragm. Its essential feature is a sudden inspiratory contraction of the diaphragm occurring and in conjunction with a rapid closure of the glottis; this results in an abdominal spasm, inspiration and sudden explosion of air, consequent vibration of the completely, or partially, closed glottis and a hiccough sound which may at times assume the character of a bark.

Hiccough is a symptom which may vary in degree from a slight transitory to a severe, and at times, a grave type. The underlying cause of this affection may be a trivial disturbance amenable to the simplest treatment, or, on the other hand, it may be due to the greatest form or organic disease which, notwithstanding the most intensive and prolonged treatment, terminates in death.

The various factors which enter into the etiology of hiccoughs are the following:

1. Neurotic and unknown cause.
2. Reflex.
3. Infectious and toxic.
4. Affections of the thoracic viscera.
5. Affections of the abdominal viscera.
6. Cerebro spinal and other organic nervous diseases.

From the ushering in of our lives to the exit of same, we have all experienced at one time or another and attack of hiccoughs. In early infancy from dietic errors, through adolescence to adult life through discretions and in later years through excesses, paroxysms of hiccoughs are met with.

In Plato's time, we read from his symposium, it was the time of Aristophanes to make a speech, but either he had eaten too much or from some other cause he had the hiccoughs and was obliged to change turns with Eryximachus, the physician. Said Eryximachus. "Let me recommend to you to hold your breath, and if after you have done so for some time the hiccoughs are no better then gargle with a little water. If it still continues tickle your nose with something and sneeze, and if you sneeze once or twice, then the most violent hiccoughs are sure to go."

*Read before the Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

The system was successful, so we read. Aristophanes said a little later: "The hiccough is gone; not however until I applied the sneezing—and I wonder whether harmony of the body has a love for such noises and ticklings, for I no sooner applied the tickling than I was cured."

A review of the literature reveals few cases of hysteria with hiccoughs as the predominant feature. Gordon B. New, Mayo Clinic, reports a case of post-operative hiccoughs for five months, and again we read of a case of singultus gastricus nervosus by Arthur Bassler, N. Y. Medical Journal, this condition being associated with a constitutional disorder, *i. e.*, gastro-intestinal.

There have been episodes of epidemic hiccoughs reported in various parts of the United States. Many of these cases were found to be associated with an influenzal epidemic and related to encephalitis lethargica as recorded by Gadham during 1919, 1922 and 1924 in the Winnipeg epidemic. During another epidemic, cases were seen by Martinet of Paris without apparent organic symptoms and were brought into being through the clamors of the alarmist and termed hysterical.

CASE REPORT.

The case presented today comes under the type termed neurotic and unknown cause:

A single white female patient, aged 18 years was admitted with the diagnosis of psychoneurosis hysteria. Family History: Father living and well, age 52 years. Mother living and well, age 49 years. Five sisters living and well. Three brothers living and well. No mental or nervous disorder, tuberculosis or malignancy in family history. Personal History: Pertussis when a child. Schooling to third grade. Menses at 16 years. Always regular. Never employed. Remained at home helping with household duties. Good mixer. Went about socially. Had similar attacks of present complaint for past three years and only when nervous as she terms the provocative cause. These upsets usually occur following altercations or disputes with father, whom she thinks is severe in his discipline. No data of sexual experience. No history of operation, fractures or other illness as such. Present Illness: Began July 6, 1924, following a dispute with her father regarding going out with boys, as she terms it. She later walked to the village and had a coca cola, thinking this might stop the hiccough which continued. While at home all remedies were tried, to quote her, even to the extent of being chloroformed for periods at a time. Was finally brought to the city and admitted to hospital and placed in neuro-psychiatric ward. Date of Hospital Residence: She was directly put to bed, isolated and all energies directed to stopping hiccoughs. Various remedies, narcosis excepted, were tried without avail. All medication as such was discontinued. Suggestive therapeutics were then employed. This, as explained to the patient, was a method of procedure to aid in her recovery. The epigastrium was painted with chloroform at various times daily. To the nares and throat was applied a 10 per cent argyrol solution. This treatment was augmented by interviews at various times as to the feasibility of her recovery, when on July 21, 1924, the hiccoughs disappeared. While there was a marked weakness during the attack there was never any prostration as such. She was somewhat anxious as to the outcome of her spell as she termed it.

Following cessation of hiccoughs routine examinations were begun with the result of a basal metabolism reading of plus 22, and the findings of ova, uncinariasis americania and ascaris lumbricoides. These conditions were treated by routine measures.

Physical examination: Fairly well developed and fairly well nourished white female, slightly pale. No atrophies or assymetries. Adolescent thyroid. Heart and lungs negative for pathology. Thyroid fairly palpable. Neurological Examination: Revealed Kjs, Ajs and other reflexes equal and active. No Romberg, clonus or Babinski. Pupils equal, react to daylight and accommodation. No ptosis, exopthalmos or nystagmus. Sensations, gait and station normal. No anesthesia or paresthesis. No vaso motor instability as such. Tremors extended fingers. FFT, FNT, KHT performed with precision. Psychiatric Examination: Showed highly sensitized nervous female. Mental defective fundamentality. Marked emotional, volatile reaction content without psychosis. There was no evidence of hallucinations, delusions, illusions or ideas of reference or persecution. Progress Note: Her general morale continued to improve, and as a matter of precaution, and in an endeavor to observe whether a recurrence would take place, she remained in the hospital, was given systemic tonics with regular diet until 10/8/24 when she was discharged as recovered for the attack. Subsequent correspondence from

her, at various times since then, states there has been no recurrence.

CONCLUSION.

Within the realm of hysteria all conditions may be simulated. Continued solicitation with excessive medication in this type of case projects further the conversion, thereby obstructing possible recovery within a short time following onset of attack.

DISCUSSION.

Dr. C. S. Holbrook (New Orleans): The matter of differentiating an organic disturbance from hysteria is frequently a very serious problem, and there is no place where it is more difficult than it is in diagnosis of hysterical hiccough from hiccough due to some other disturbance; and one of the frequent cases of hiccough that we see today is that produced by encephalitis. This disease has many of the earmarks of hysteria, because there may be no other disturbances besides the protracted hiccoughs.

We are all, of course, familiar with the hiccoughs due to upper abdominal and thoracic disturbances. I am inclined to think that Dr. Otis is correct in the interpretation of this case because of one particular thing, and that is that this girl had found a way of escape from treatment that was very disagreeable to her, and she had, on two or three previous occasions, had similar attacks of hiccoughs when the home environment was not pleasant.

I further believe that this girl was probably defective as she went only to the third grade, the people at home were probably placing too much responsibility upon her. This girl had the intelligence of an eight or nine-year-old child, and she was expected to assume the responsibility of an adult. She further had a hook worm infection with some other parasite; the removing of that and the building up of her general body tone, probably also played an important part and was very much in line with the papers previously read.

These cases of hysteria, unless they do clear up quite readily at home, under comparatively simple treatment, should not be handled with the family around. Little progress can be made in curing hysteria at home, unless it is of the milder type, the more severe type should always be handled in an institution.

Dr. D. O. Willis (Leesville): I had a case of what I called hysterical hiccough, about two years ago, a bright, intelligent, vigorous young lady, about twenty years old. I searched her system in every way with all my ability, for some cause for this, and I could find nothing except home environment.

Her mother was dead and her father married again, and there would come up home disturbances, and, as a result of this, she visited quite a good deal. They did not live in our town, but she visited there very frequently, and she had several of those attacks that I had known of through my daughter, and had been treated by other physicians.

She had one of these attacks while visiting with my daughter, after one of these home disturbances, and while in my home, the night she came, she took a very violent attack of hiccoughs. After my investigation, I decided that it was purely neurotic and I did a very harsh thing, I gave her a very strong hypodermic of apomorphin, so much that it caused her not only to empty her stomach contents entirely, but to be very sick; it made her very limp, limber, almost lifeless for hours, however, it cured the attack completely.

She had an uncle who was a physician, whom she spent a good deal of her time with in Texas. She left my house soon after recovering from this attack, and I wrote her uncle and told him what I had done, and he used this on her several times, himself. He wrote me, later, and she never had another attack as bad as the one she had at my home, after having, I think, perhaps four hypodermics of apomorphin she was cured, I think, with some other treatment suggestive and a little management in a general way.

Dr. L. L. Cazenavette (New Orleans): Attacks of hiccough, especially of the hysterical type, are at times very severe, and those of us who have seen patients under such conditions, especially when the hiccough has lasted not only hours but days can not but realize that those unfortunate patients have something serious affecting them.

While I have in the past controlled such cases by the use of suggestion enforced by electro-therapeutic measures, I think that our present views of hysterical manifestations demand a thorough analysis of the psychic and real cause of such troubles.

Dr. M. M. Collins (Hosston): I just want to mention a case which I had in France. An enlisted man had hiccoughs, I made two visits to see him and no results. Finally, I sent my sergeant down, a bright chap, to see how he was getting along. He came back, I said, "How is he?" He said, "He was pretty bad when I got there, but he is all right now." I said, "What did you give him?" He said, "I gave him two pins, I made him put the two points together and he is all right now."

Dr. E. McC. Connelly (New Orleans): I think in justice to hysteria, I would like to point out that while hysterical hiccoughs do become and are quite serious at times, that these cases that have been cited, as Dr. Holbrook mentioned, are probably the simplest reaction we have of hysteria, they were simply the patient's method of escaping from an intolerable situation, or what to them was an intolerable situation.

All hysterical phenomena and all hysterical mechanisms, however, are not quite so simple as that, and I should hate to have anyone feel that the curing of hysteria was always depending upon the suggestion of apomorphin or electricity or anything of that sort. Of course, those measures are to be used and they are frequently effective, but, as Dr. Cazenavette pointed out, it is always well to follow up our suggestions with some form of analysis, and endeavor in some way, not only to find out, yourself, what is the underlying factor, but get the patient to see it.

Dr. L. R. De Buys (New Orleans): I rise to call attention to the fact that infants oftentimes have hiccup and without any evidence of a nervous disturbance. I first wish to remark that some of you are using the term hiccough and others hiccup. Recently I had occasion to investigate the term and found that hiccup is in all the latest dictionaries. Hiccup is a symptom and in early life at least is usually indicative of some digestive conditions. Recently an investigator demonstrated in infants that when hiccup existed that there was a regurgitation of food into the oesaphagus through the cardia. This explains how the taking of several swallows of water would overcome the hiccup—the water acting by gravity pushing the food back into the stomach especially when the breath was held so that the diaphragmatic message would not interfere with the water pressure.

Dr. C. S. Miller (Jackson): I did not hear all of Dr. Otis' paper, but I am very much interested in the subject of hysterical hiccough. I have not seen many cases, because usually they get over their condition before they go to the hospital, but I had one case admitted to my service in the case of a young girl who was feeble minded; she was a member of a large family, being the oldest child. It fell to her lot to look after the other children, as her mother was dead, and take care of the house work and do the cooking and everything else about the home.

She came to the hospital with a history of having had hiccoughs, lasting anywhere from two days to a week, at irregular intervals. They thought by this hiccough continuing to be present coupled with a condition of feeble mindedness, that she was a psychiatric patient and she was sent to the hospital. Nothing could be found to account for it and as soon as she was placed in hospitalization, all symptoms of hiccoughs would disappear. So, in that particular case, her hiccough was simply hysterical reaction to avoid the enormous amount of duty and responsibility placed upon her, so that is the only case of hysterical hiccough that I have seen. I was very much interested in this subject.

Dr. W. J. Otis (New Orleans, closing): I wish to extend my appreciation to all for their general discussion of my paper. By mentioning the terms "hiccough" and "hiccup," I was conforming to local usages. While "hiccup" is the symptom of many disturbances of the metabolic economy, the type referred to was purely functional. Though psychotherapy plays a part in the treatment of these cases, in this particular case it is evident that it was the means of recovery. Never treat the nervous conditions of your patients lightly, or attempt to be facetious, otherwise, both the patient and the family will lose confidence in your ability. The question of the indiscriminate use of Apomorphia is to be condemned and I would caution against the use of same, unless one understands their pharmacology. Its action is central, the vagus will not be abused, and in cases where there is idiosyncrasy there have been unfavorable results—that is, there are cases on record where the patient has collapsed, lapsed into unconsciousness and passed into an early death. To sum up—reach in, be sympathetic and help by intelligent analysis.

THE OBSERVATION OR DISREGARD OF TRAFFIC REGULATIONS.—The public tolerates the speeding ambulance on humanitarian grounds, little realizing that the occasions on which speed is necessary are really very few. It is very hard to conceive of the necessity for speed in going to receive a patient ill with scarlet fever or any similar illness. In the delivery of any patient to a hospital the greatest needs are safety and comfort. The sole exception is in case of hemorrhage, and even in cases of hemorrhage the instances in which speed is required are very few. If hemorrhage cannot be controlled at the place of injury the chance of benefit by a reckless dash to a hospital is very slight indeed.

As our cities come of age the public begins to realize that certain spectacular practices of the past are little more than gestures. The time has come for our hospitals to take their part in the campaign for safety in our streets. Taking chances may be justified in those exceedingly rare instances in which speed is essential, but it is never justified under other conditions. Patients going to hospitals have the right to a safe, comfortable and quiet journey. Nothing else should be tolerated if the good of the patient is to be considered,—N. E. J. Med., 199:1278, 1928.

A BACTERIOLOGICAL STUDY OF THE GRAM NEGATIVE BACILLI FOUND IN FIFTY CASES OF INFECTION OF THE URINARY TRACT.*

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It has long been the custom in the infections of the urinary tract to make a diagnosis of B. coli infection upon the finding of pus cells and gram negative bacilli with the general morphology of B. coli in a properly collected specimen of urine. This, of course, we usually consider to mean that the organism is either B. coli communis or B. coli communior. Appreciating the many different organisms belonging to this great colon-typhoid group and realizing that they are all practically identical in their morphology, it was thought that a careful bacteriological study of a series of these cases would be of some interest.

With this idea in mind fifty cases from the Cystoscopic Service of Charity Hospital were used for this work. It was thought that specimens from this service would give us urines from the kidney pelves and from the bladder, obtained by careful catheterization and practically eliminating the possibility of external contamination.

We selected those cases in which the urine showed pus cells and a gram negative bacillus only; if any of the pyogenic cocci were also present the case was rejected. In all of the cases more or less phagocytosis of the bacilli was noted. The cases were taken consecutively as received from the cystoscopic rooms.

The urines were first cultured in broth and then plated on endo media. Colonies were picked from these plates with special attention being made to lactose and non-lactose fermenters and to any slight difference in appearance of the colonies present. The plants were then made on agar slants and used as working cultures. The isolated organisms were then run through the following sugar broths: dextrose, maltose, mannite, xylose, arabinose, rhamnose, sorbit, dulcite, lactose, salicin, saccharose, raffinose, inosite dextrin, adonite and inulin. They were grown in litmus milk and on gelatin; all were tested for indol production and the Voges-Proskauer reaction. In determining motility the organism was run through at least six generations in broth unless motility was established sooner.

Shortly before the war a committee of the Society of American Bacteriologists projected a very intensive study of the colon-typhoid group. The war delayed the completion of the task, but very important individual contributions were published by Krumwiede and Rogers; Krumwiede, Pratt and Kohn, 1916a, 1916b, 1917; Krumwiede, Kohn and Valentine, 1918; Rogers, Clark and Evans, 1914, 1915; Rogers, Clark and Lubs, 1918.

The publication of the work of Winslow, Kligler and Rothberg in 1919 presented the result of a very detailed study of the colon-typhoid group with special reference to their fermentative reactions and a revision of the literature up to 1919. They studied 160 cultures of colon-typhoid bacteria in the collection of the American Museum of Natural History. Very little can be added to or taken from their work up to this time, and we have made their masterful article a guide in the classification of the bacilli found in our series of cases.

The basis for our classification of the different species found in this series follows:

B. alcaligenes were actively motile Gram negative bacilli which failed to ferment any of the carbo-hydrates.

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B. morgani were actively motile Gram negative bacilli which fermented only dextrose, producing acidity and gas, also producing indol. It was differentiaed from B. shiga which also ferments dextrose alone, but produces no gas and is indol negative.

B. typhosus was an actively motile Gram negative bacillus which fermented mannite, maltose, xylose and sorbit without the production of gas. It was differentiated from the B. para typhosus group as they are all gas producers. This organism was strongly agglutinated with known anti-typhoid serum.

B. para-typhosus B. and B. enteritidis were identical in their fermentative reactions, both fermenting dextrose, maltose, mannite, xylose, arabinose, rhamnose and sorbit with the production of acidity and gas. We classed the one as B. para-typhosus B. because we obtained strong agglutination with this strain and a known anti-para-typhoid B. serum; while with the other we failed to obtain agglutination, and, therefore, classed this strain as B. enteritidis. Culturally these two species are identical.

This brings us to the lactose fermenters of the group which includes B. coli communis, B. coli communior, B. neapolitanus, B. lactic acid and B. arogenes, all of which ferment dextrose, maltose, mannite, xylose, arabinose, rhamnose, sorbit and lactose with the production of acidity and gas. The fermentation of dulcite was not constant for any of these species so that it was of little value in our classification.

B. coli communis was salicin positive and saccharose negative. B. coli communior was salicin negative and saccharose positive. B. neapolitanus was salicin positive and saccharose positive while B. lactic acid was salicin negative and saccharose negative. B. arogenes fermented salicin and saccharose as well as inosite and adonite and was the only specie of the lactose fermenters that failed to produce indol. In dextrose broth B. arogenes produced acetyl-methyl-carbinol (Voges-Proskauer positive) while the other species failed to do so.

B. arogenes was differentiated from B. cloaca by its failure to liquify gelatin. Aside from this one factor they are probably identical in their cultural characteristics.

Incidence of the different species of the colon-typhoid group in this series:

B. coli communis, 12 cases, 24 per cent.
B. arogenes, 11 cases, 22 per cent.
B. alcaligenes, 10 cases, 20 per cent.
B. coli communior, 9 cases, 18 per cent.
B. lactic acid, 7 cases, 14 per cent.
B. morgani, 2 cases, 4 per cent.
B. neapolitanus, 1 case, 2 per cent.
B. typhosus, 1 case, 2 per cent.
B. para-typhosus B., 1 case, 2 per cent.
B. enteritidis, 1 case, 2 per cent.

There were double infections in five cases or 10 per cent of the group; two cases showed B. coli communs with B. alcaligenes, one case B. arogenes with B. morgani, one case B. coli communior with B. arogenes and one case B. coli communior with B. alcaligenes.

CONCLUSIONS.

In a careful bacteriological study of the bacilli in fifty cases of urinary tract infection showing gram negative bacilli, morphologically B. coli, only twenty-one cases, or 42 per cent, showed proved B. coli communis or B. coli communior. Twenty-nine cases, or 58 per cent of the series, were proved to be other species of the colon-typhoid group of bacteria.

Stock vaccines of B. coli in all these cases would certainly have proved of little value other than that of producing a non-specific protein reaction in over half of the cases.

REACTIONS OF THE GRAM NEGATIVE BACILLI ISOLATED FROM THE FIFTY CASES IN OUR SERIES

CASE	PATIENT	URINE FROM	SEX	DEXTROSE	MALTOSE	MANNITE	XYLOSE	ARABINOSE	RHAMNOSE	SORBITE	DULCITE	LACTOSE	SALICIN	SACCHAROSE	RAFFINOSE	INOSITE	DEXTRIN	ADONITE	INULIN	GELATIN	LITMUS MILK	INDOL	VOGES-PROSKAUER	MOTILITY	CLASSIFICATION OF ORGANISM
1	J. C.	B	M	AG	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	sl.ac.-alk	+	—	+	B.morgani
2a	J. L.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	—	—	ac.coag.	—	+	—	B.arogenes
2b	J. L.	B	M	AG	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	sl.ac.-alk	+	—	+	B.morgani
3a	M. G.	RK	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
3b	M. G.	RK	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
4	C. H.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
5	A. K.	LK	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
6	K. J.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
7	F. D.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	—	—	—	—	—	—	—	—	ac.coag.	+	—	—	B.lactic acid
8	R. B.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.neapolitanus
9	L. B.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
10	C. S.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	—	—	ac.coag.	—	+	—	B.arogenes
11	Mrs. D.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
12a	W. S.	B	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
12b	W. S.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunior
13	B. R.	LK	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
14	J. B.	B	M	A	A	A	A	—	—	A	—	—	—	—	—	—	A	—	—	—	sl.ac.-alk	—	—	+	B.typhosus
15	Mrs. A.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	—	AG	—	—	ac.coag.	—	+	—	B.arogenes

AG = Acid and Gas A = Acid — = No Reaction

REACTIONS OF THE GRAM NEGATIVE BACILLI ISOLATED FROM THE FIFTY CASES IN OUR SERIES (CONTINUED)

CASE	PATIENT	URINE FROM	SEX	DEXTROSE	MALTOSE	MANNITE	XYLOSE	ARABINOSE	RHAMNOSE	SORBITE	DULCITE	LACTOSE	SALICIN	SACCHAROSE	RAFFINOSE	INOSITE	DEXTRIN	ADONITE	INULIN	GELATIN	LITMUS MILK	INDOL	VOGES-PROSKAUER	MOTILITY	CLASSIFICATION OF ORGANISM
16	Mrs. B.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
17	H. R.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.lactic acid
18	T. M.	LK	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
19	E. B.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
20	Mrs. J. S.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.coli communis
21	Mrs. N.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
22	E. N.	B	M	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	—	—	—	sl.ac.-alk	—	—	+	B.enteritidis
23	W. C.	RK	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
24	Miss W.	B	F	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	—	—	—	sl.ac.-alk	—	—	+	B.paratyphosus B.
25	L. H.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.coli communis
26	E. T.	RK	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
27	Mrs. E. L.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.coli communis
28	Mrs. G. M.	RK	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
29	M. B.	RK	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
30	E. K.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.coli communis
31	Mrs. M.H.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.coli communis
32	A. S.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
33	A. N.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.lactic acid
34	M. P.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	—	—	—	—	—	AG	—	—	ac.coag.	+	—	+	B.lactic acid

35	A. B.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
36	C. J.	B	F	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
37	E. D.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
38	L. G.	B	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
39	A. C.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
40	M. L.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	—	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.latctic acid
41a	M. P.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	
41b	M. P.	B	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
42	E. P.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	AG	—	—	ac.coag.	+	—	+	B.lactic acid
43a	L. Y.	LK	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.colicommunis
43b	L. Y.	LK	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.alcaligenes
44	J. L.	B	M	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes
45	T. W.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	AG	—	—	—	ac.coag.	+	—	+	B.coli communior
46	M. C.	LK	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	—	—	—	—	—	—	—	ac.coag.	+	—	+	B.lactic acid
47	C. B.	RK	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	alk.	—	—	+	B.lactic acid
48	A. B.	RK	M	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
49	A. D.	B	F	AG	AG	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	—	—	—	—	—	ac.coag.	+	—	+	B.coli communior
50	L. S.	LK	M	AG	AG	AG	AG	AG	AG	AG	—	AG	AG	AG	AG	AG	AG	AG	—	—	ac.coag.	—	+	—	B.arogenes

AC = Acid and Gas A = Acid — = No Reaction

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DISCUSSION.

Dr. Chaille Jamison (New Orleans): If you have never attempted work like Dr. Gondolf has reported today, you have no realization of the amount of effort it entails. I undertook a somewhat similar subject when I was interested in that work, and it gave me no results simply because I was not willing to put forth the effort. Dr. Gondolf is to be congratulated and commended on a splendid and difficult piece of work. I believe, also, that this kind of work may have a bearing on clinical medicine.

We see constantly cases of infection of the genital tract that are responsible for constitutional signs and symptoms that will be cleared up quite easily by one maneuver, when gram negative bacilli are found in the urine by certain antiseptics; others will require other action. I think the explanation lies in the different strains of colon bacilli. It would be interesting to know something about the pathogenesity of the various strains, because many of us feel clinically that positive blood cultures that show such organisms, gram negative bacilli, may have little significance. I have seen spinal trouble classed as belonging to the colon group.

I believe if this study were pursued with the idea of the pathogenestic, and the various forms of treatment to be employed it might give most valuable clinical results. Those of us who are at all familiar with the clinical work on the urinary tract know the infections due to one of this group. I can congratulate Dr. Gondolf again.

Dr. Foster Johns (New Orleans): I would like to confirm Dr. Jamison's remarks with regard to the vast amount of work that this summary of Dr. Gondolf's represents.

I have always believed that an accurate bacteriologic classification of the invading bacteria in pyslitis was most essential to treatment and prognosis. With more or less specific medicaments at their command, the urologists are beginning to insist more and more on a closer investigation of the exact varieties of bacteria present. From a prognostic viewpoint, it may be of interest to note that quite recently an exhaustive piece of work on infections of the kidney with bacillus fecalis alkaligines was done at the Mayo Clinic in which the evidence pointed toward this infection being responsible for most kidney stones. Infection with this particular organism by an extremely mild clinical course before mechanical effect of the stones becomes manifest. These clinical symptoms are easily controlled and the patient is allowed to drift along until calculi form when only operative measures or a lucky ability to pass the contrations makes possible a cure of the condition. These bacteria look like and are usually recorded as colon bacili from a direct microscopic examination of the urine sediment. A careful bacteriologic identification early in the course of such an infection, with prompt and energetic treatment, would certainly be invaluable to the patient.

Dr. A. Mattes (New Orleans): I am quite interested in the work Dr. Gondolf has presented in regard to the classification of the bacteria found in urinary analyses. It is rather interesting to note that one of the common causes of failure from therapy can probably be attributed to our faulty conclusions in the past. We have been

taught for a number of years that practically all gram negative bacilli were coli or coli-communior and paid very little attention to further classifications.

Now, with the use of various sugar waters, and other media, as Dr. Gondolf has brought out, he has been definitely able to demonstrate not only the coli and other types of organisms in that group, but he is able to demonstrate the fact that in a fair per cent of cases we are dealing with other bacterial infections of the urinary tract. It is possible, in the majority of cases, where we fail to derive any benefit from therapy, either locally or constitutionally, it is due to the fact that we are dealing with an organism that cannot be benefitted by present-day treatment. If these cases were subjected to the extensive study that Dr. Gondolf has made, we most certainly would prove that they probably will fall into one of the groups other than bacillus coli or coli-communior.

Chairman W. H. Harris: Any further discussion? I would like to add just a word to what has been said. I believe this paper is certainly worthy of every commendation, and it is really a very suitable paper for a bacteriological meeting. I think one of the features of Dr. Gondolf's observations which is along the line we have previously recognized, is the realization that all of these organisms are inhabitants of the intestinal tract.

We know, of course, that there has been a great bit of dissertation as to the method of invasion of bacteria into the pelvis of the kidney, the direct ascending route, the matter of the bacteremia, and so on. But it will be noted that his enumeration comprises entirely intestinal flora. While the portal system is often blamed, why is it that it is so much more frequent in females and rare in males?

I think that there is a tendency on the part of bacteriologists in routine laboratory work to report right along "B" coli, and usually upon insufficient basis. I am very pleased that Dr. Gondolf has favored us with this admirable paper, because those of us who have done this work as Dr. Jamison and Dr. Johns mentioned can appreciate most fully the great amount of work carried out. As I said in the beginning, it is a rapid fire presentation of a tremendous amount of work. Is there further discussion?

Dr. N. F. Thiberge (New Orleans): The paper so far is of negative value in showing the treatment which has been ineffective, and I think Dr. Gondolf would do the section a favor if he would give us some positive information, some indication in the future as to what treatment in those cases would be available, whether he thinks a vaccine in those cases would yield better results than a stock of vaccine, and if not, what other line of treatment he would indicate.

Dr. H. J. Gondolf, New Orleans (closing): Of course, this was purely a bacteriological study and quite a bit of work would have to be done to prove the pathogenicity of these organisms; but, I feel that we have quite a bit of reason to believe they are pothogenic.

More or less recent literature has shown us that even B. alkaligines has produced septicemia with prolonged periods of fever. We know that B. lactis arogenes and B. lactic acid have produced meningitis in babies.

All these organisms are inhabitants of the intestinal tract and if B. coli is an inhabitant of the intestinal tract and can produce an inflammatory process in the urinary tract, I see no reason why these other organisms cannot do such a thing also.

We know that the portal circulation carries some few bacteria into the liver from the intestinal tract and I believe it was Adami who for a time believed that B. coli was the causative agent in cirrhosis of the liver, because he found this organism constantly in the liver. Every one of us are picking up organisms through the circulation at all times, and it merely means whether we have sufficient immunity to kill out the bacteria or whether they may produce some inflammatory process.

Now, with regard to treatment, that is more than I would attempt, but I do believe that the most of the men who treat these conditions, when they do not get results with their irrigations and their use of antiseptics, resort to vaccine therapy. Now, I think if they use stock vaccine that certainly in the majority of cases they are not going to get any specific reactions and, therefore, poor results. If you are going to resort to vaccine therapy, then I think autogenous vaccine should be the therapy of choice.

VARICOSE VEINS AND THEIR SEQUELAE.—One hundred and sixty cases of varicose veins and their sequelae were studied by Géza de Takáts, Chicago, as to age and sex incidence. More than 1,000 injections with 50 per cent dextrose were made. An individualizing management, consisting of supportive, injection and surgical treatment or their combination is described. The histological reaction of the vein following injection has been studied. Immediate results of the various forms of treatment are tabulated. The possibility of pulmonary embolism following injection treatment and surgical treatment is discussed. The end-results of the surgical and injection treatment can be estimated only after five years. Recurrences are well known to occur after radical excisions and may be expected following the injection treatment.—Jour. Am. Med. Assn., 92:775-783, 1929.

ANTIGENS AND THE PRECIPITATION TEST.*

H. W. BUTLER, M. D.,†

NEW ORLEANS.

The value of the precipitation test for the diagnosis of syphilis is everywhere recognized. There are three methods now in use for reading the reaction of this test: First, reading by transmitted light the presence or absence of small particles suspended throughout the liquid, for example the Sigma or Kahn tests; second, the reading of a cracked emulsion in which the particles have settled to the bottom of the tube, leaving a clear or semi-clear liquid above, for example the Meinicke test; third, reading made directly from the precipitation on a slide.

The principles governing the reactions are the same in all precipitation tests, so that when a technic is decided upon the antigen is modified in such a way as to be adapted to that particular method, or else the method is changed so as to be suitable to the antigen.

By the use of the Meinicke technic on a series of 500 cases, the percentage of agreement was found to be 97.5 per cent. The close agreement with the Wassermann, the simplicity of the performance of the test, and the sharp demarcation between the negative and positive reactions make the test valuable by this method. The use of an acidulated or alkalinized antigen containing a gum resin flocculation indicator, as proposed by Meinicke, possesses distinct advantages over other methods of performing the precipitation test. As the horse heart extract used by Meinicke is difficult to obtain in America, I wish to present in this paper methods of adapting our standard antigens for use with this test.

*Read before the Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

†(From the Department of Medicine, Tulane University School of Medicine.)

MEINICKE TECHNIC.

One cubic centimeter of the horse heart antigen is measured into a 20 cc. test tube. Ten cc. of a 3 per cent saline solution is measured into a second similar tube. Both tubes are placed in the water bath at 45° C. for 5 to 10 minutes, after which the contents of the tubes are poured together twice. One cc. of this suspension, while warm, is pipetted into a test tube into which has been previously placed 0.2 cc. of blood serum, not inactivated. The tubes are shaken and allowed to stand at room temperature over night. Reading: The strong positive sera appear crystal clear with the sediment at the bottom of the tube. The moderately positive sera appear hazy with a considerable amount of sediment at the bottom. The weakly positive sera are slightly cleared with a small amount of sediment at bottom of tube. The negatives appear as when first set up, "milky," with no sediment.

TECHNIC FOR SPINAL FLUIDS USING THE HORSE HEART ANTIGEN OF MEINICKE.

One-half cc. of the emulsion, prepared as for blood sera, is pipetted into a tube containing 0.5 cc. of spinal fluid and allowed to stand over night. Strongly positive spinal fluids will settle out in the same way as the blood sera, but the microscope is necessary in most cases. A characteristic clumped precipitate appears in the positives, but the negatives show no such precipitate. Comparative results on blood sera using the Kolmer Wassermann antigen and the original Meinicke antigen showed an agreement of 97.5 per cent. Comparative results on spinal fluids using Kolmer Wassermann and original Meinicke showed 97.6 per cent agreement.

KOLMER ANTIGEN.

Kolmer's Wassermann antigen can be changed into a precipitation antigen by diluting and adding a 5 per cent tincture of tolu (made from the balsam) as an indicator.

Antigen: 5 cc. Kolmer antigen
25 cc. Alcohol, 95 per cent.
10 cc. Tincture of tolu, 5 per cent.

Diluting saline: 100 cc. distilled water
3 gms. sodium chloride
0.15 cc. of 10 per cent sodium hydroxide

Some antigens require more alkali than others, depending upon the concentration of lipoidal substance. Enough antigen should be added to this formula to reach the point of saturation for that particular antigen, the object being to make the suspension as unstable as possible without producing a precipitate in the negative sera. It should be added to the point just short of this amount. The more antigen that can be added, the more sensitive the reaction; and the more alkali that is added, the less sensitive it is. The correct amount of antigen is obtained by testing against negative sera. The amount ranges from 2 to 5 cc. if the Kolmer method of extraction is used. The alkali is necessary to render the ether extract portion of the antigen suitable for emulsification.

One cc. of the antigen is measured into a 20 cc. test tube, and 10 cc. of the alkaline saline measured into a second 20 cc. test tube. These are placed into the water bath at 56° for five minutes. They are then poured together twice. One cc. of this suspension is measured immediately, while still warm, into a test tube containing 0.2 cc. of blood serum which has not been inactivated. The suspension precipitates when it becomes cold, unless serum is added.

Spinal fluids: A Purdy tube is filled to the 3 cc. mark with spinal fluid. Two cc. of a saturated solution of ammonium sulphate are added and well mixed. It is allowed to stand at room temperature for 15 minutes and then centrifuged. The supernatant fluid is pipetted off, and the globulin is taken up in 0.2 cc. of negative serum. One-half cc. of the suspension as used for blood sera is added. Strong positive spinal fluids do not require concentration of the globulin. Results obtained with blood sera were 97 per cent agreement using the Kolmer antigen both in the Wassermann and precipitation reactions.

Veal heart extraction: Fresh veal hearts, the size of a small fist, are selected and the auricles and superficial fat removed. The muscle is ground in a sausage grinder and spread on paper and dried by an electric fan. After it is completely dried, it is reground and extracted with ether, as follows: Four hundred cc. of ether are used to each 100 gms. of dry ground heart and allowed to act for ten minutes, shaking frequently. The ether is filtered off and 300 cc. are added three different times to the heart muscle and treated in the same manner. The heart muscle is now dried completely free from either, and for each gram a muscle, 5 cc. of 95 per cent alcohol are added and masceration is allowed to continue for three days at room temperature, after which the alcohol is filtered off and made up to the original volume with 95 per cent alcohol.

Some of this extract is saturated with cholesterin (to 100 cc. add 0.6 gms. of cholestrin).

Veal heart extract ..... 15 cc.
Veal heart extract, cholesterinized ..... 15 cc.
Alcohol, 95 per cent ..... 15 cc.
Tincture of tolu, 5 per cent ..... 15 cc. to 20 cc.
Alcohol containing 1 per cent benzoic acid ..... 1 cc.

Tolu varies. Add enough to the antigen to produce opacity to the test. One cc. should require 0.5 cc. of N/10 NaOH for neutralization. Phenolphthalein is used as an indicator. The pH is 4.8.

Diluent: 3 per cent saline.

One cc. of antigen is measured into a 20 cc. test tube and 10 cc. of 3 per cent saline into a second 20 cc. test tube, heating in a water bath as before at 56° two to five minutes. Heating at 56° for more

than five minutes decreases rapidly the sensitiveness of the test. Mix by pouring back and forth several times. One cc. is measure into a test tube containing 0.2 cc. of blood serum (not inactivated). Reading is made after standing over night at room temperature.

Slide test: If the slide method is desired, the antigen is diluted only three times; *i. e.*, 0 3 cc. antigen and 0.9 cc. of 3 per cent saline. A 1 cc. pipette, as short as can be obtained, is fitted with a Wright's rubber bulb. The antigen is measured into a test tube with the dry pipette, and then, with the same pipette, 0.9 of 3 per cent saline is taken up and forced into the test tube containing the antigen. The mixture is sucked back and forth several times. No heating is required. Three drops of clear serum, using a capillary pipette, are placed upon a slide and three drops of the antigen mixture are placed alongside of the serum. It is mixed with a toothpick, and the slide rocked several times to insure thorough mixing. It is then laid aside for five or ten minutes, depending upon the amount of drying that takes place. As the preparation dries, it passes through different degrees of concentration, so that at some stage the zone of inhibition will be missed and precipitation allowed to take place. The positive bloods will show the characteristic precipitation, but the negatives will remain granular. The slide method should be performed at room temperature. It is slightly more sensitive than the tube method, and the reading is more striking.

Spinal Fluids: The globulin is concentrated, using the Kahn technic as for the Kolmer antigen. It is dissolved in 0.2 cc. of normal saline or negative serum and one-half cc. of suspension is added. Strong positive spinal fluids can be read on a slide in the same way as in blood serums. Concentration is necessary in most cases.

RESULTS WITH THE VEAL, HEART, ANTIGEN AND THE KOLMER WASSERMANN SYSTEM.

	Wassermann	Prescription
186	Strongly positive	Strongy positive
1	Strongly positive	Negative
1	Weakly positive	Negative
1	Negative	Strongly positive
4	Anticomplementary	Strongly positive
1	Negative	Moderately positive
9	Moderately positive	Strongly positive
10	Weakly positive	Strongly positive
10	Negative	Weakly positive
3	Weakly positive	Weakly positive
3	Strongly positive	Moderately positive
5	Moderately positive	Moderately positive
2	Strongly positive	Weakly positive
1776	Negative	Negative
2012		

Comments: The Meinicke reaction, in its present form, is the nearest approach to the Wassermann in specificity of any of the precipitation tests, in my opinion. It is easy to perform. Two-tenths cc. of raw serum is measured into a test tube and 1 cc. of the warm antigen suspension added. The tube is shaken and allowed to remain at room temperature over night. It offers no difficulty in reading. If there is any criticism to make, it is that the horse heart extraction may be a little too sensitive. One case in a routine examination gave a moderately positive Meinicke and negative Wasserman, with no history and no clinical manifestations of syphilis. Another case, in which the spinal fluid was examined, the Wassermann and globulin were negative, the cell count 1, showed a moderately positive Meinicke. These reactions were not considered in the diagnosis. There is frequently a quantitative disagreement between the Wassermann and the precipitation ractions. A weakly positive Wassermann may give a strongly positive precipitation, and a strongly positive Wassermann may give a weakly positive precipitation. Occasionally, one reaction will be strongly positive and the other negative. Two Wassermann systems were used in checking the precipitation tests in many cases.

Conclusions: The Meinicke precipitation technic, with some variation, can be applied to any of the standard antigens. It is easy to perform and requires the minimum amount of time and laboratory facilities. Inactivation of the serum is unnecessary. There is no difficulty encountered in the interpretation of the results, which show a high degree of accuracy as compared with the Wassermann reaction.

I wish to express my deep appreciation to Dr. G. H. Hauser and the entire staff of the Pathological Department of Charity Hospital for their excellent co-operation in furnishing the bloods and for their Wassermann interpretations.

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DISCUSSION.

Dr. Foster Johns (New Orleans): The precipitation test for syphilis has come to stay, either as a check on the Wassermann or in many offices to supplant it. Dr. Butler has given us this afternoon a bare resumé of three years of constant work, and much of it original in idea, in trying to adapt our well standardized antigens to use in this test with the idea of closer correlation in the diagnoses thus made by different methods.

While he has been able to reach a fair degree of agreement in the readings of the two tests for syphilis, I doubt if we will ever be able to get a complete agreement for the following reason. Syphilis is a disease of the intercellular bridges between the cells of the vascular system. The intercellular substance is dissolved or liberated, is absorbed into the general circulation and there acting as a foreign body, or "antigen," stimulates several different types of antibodies. One of these substances is the so-called specific amboceptor, or complement binding antibody, that we test for the presence of with the Wassermann. Another is an agglutinin which conglomerates or agglutinates the particles of a finely divided suspension of the antigen and which gives us the precipitin test. These different antibodies are produced in variable amounts and with different degrees of rapidity in diffrent individuals.

As a rule the Wassermann reaction is somewhat more delicate and in my experience is often positive long before the precipitin reaction can be demonstrated in early syphilis. In quiescent and late syphilis, on the other hand, the precipitin test is often superior, and its findings corroborated with the spinal fluid evidence.

Of the three methods of performing the precipitin test, I can heartily agree with Dr. Butler that the Meinicke method is best. It is certainly far superior to the Kahn in my opinion in both simplicity, accuracy and workability in the everyday routine of laboratory work.

Dr. Butler's slide test and using his modification of the standard Kolmer Wassermann antigen, in my experience, is slightly less delicate than the Meinicke tube test, but as a rapidly performed check on Wassermann reactions is almost ideal.

Altogether, we owe Dr. Butler an expression of thanks for the persistence with which he has brought the precipitin test to our attention and fo. the great amount of thankless work that he has cheerfully performed in perfecting his method of performing the precipitin test.

Dr. W. H. Harris (New Orleans): We know in the instance of the precipitation test that the question of the particular artigen employed is of umost importance. If we will consider its medico-legal application in the question of determining whether or not a specimen is human blood, its authenticity and value, from a legal standpoint, we realize the great degree of accuracy of such a test.

In the instance of syphilis, however, the question of the antigen is, of course, a great connundrum to the laboratory worker. The antigen for any specific disease or any specific substance is either the organism or the substance. We know that Wassermann is the preparation of his anti-

gen originally aimed at obtained the masses of spirochetes present in the tissues of the congenital lues case. It was later learned that a non-syphilitic organ would serve the same purpose. This phenomena renders it extremely hard to understand from a specific precipitation standpoint. I think Dr. Butler is to be commended on persisting in his valuable work in attempting to simplify and standardize, if possible, the Kahn test.

I would like to ask Dr. Butler if he is familiar with any work that has been carried out on the employment of a culture as a precipitinogen in this test.

Chairman J. H. Musser (New Orleans): Any further discussion? I would like to re-inforce the statement of Dr. Johns. I know this work of Dr. Butler represents the examination of not ten or hundreds of blood serums, but represents the examination of thousands. It is a tremendous piece of work, and while the applicability of it may not be apparent or entirely clear at the present time, there is no question that it represents a very great advance in the diagnosis of this interesting and extremely common disease. Dr. Butler, will you close the discussion, please?

Dr. H. W. Butler (closing): To answer Dr. Harris' question: We never have tried to make an antigen from the spirochetes themselves.

REVIEWS

WOUNDS.*

ALTON OCHSNER, M. D.†

NEW ORLEANS.

"A wound may be considered as a traumatic injury resulting in a solution of the continuity of a free or potentially free surface." (Frantz[1].) As the definition implies, a wound may occur in any part of the body, either on the external exposed surface or in some of the internal organs. It is the purpose of this discussion to consider only the wounds of the external surfaces.

Wounds may be classified according to the type of injury or according to the bacterial content.

A. CLASSIFICATION ACCORDING TO THE TYPE OF INJURY

1. *Abrasion (brush burns):* An abrasion is characterized by the removal of the superficial layers of the skin, including part of the corium, so that a bleeding surface is exposed. Because of its superficial extent, however, the inter-papillary pegs of the germinal layer are left intact, as well as certain of the hair follicles, sweat, and sebaceous glands. Epithelium may grow from these inter-papillary pegs as well as from the edges of the wound.

2. *Incised wounds:* An incised wound is usually a linear defect produced by a sharp object passing through the skin and subcutaneous tissue. The length of the wound is greater than its breadth. It is characterized by sharp, clean-cut edges, there also being relatively little devitalization of the surrounding tissues. The amount of gaping of the wound depends upon its location and the amount of skin tension at that point. Because of the gaping of the wound, on cross section the wound is usually triangular in shape, being wider at the surface than at the bottom of the wound.

3. *Puncture wounds:* Puncture wounds are those characterized by relatively small openings and a relatively great depth. These wounds are usually produced by nails, knives, and bullets. The wounds are of especial importance, because of the danger of injuring important structures located deep in the wounds, such as vessels, nerves, and viscera, as well as the liability to develop certain deep infections, especially those of the anaerobic variety.

4. *Lacerated wounds:* A lacerated wound is one which is characterized by irregular edges and which is usually associated with considerable trauma and devitalization of the tissues surrounding the wound. These wounds are usually produced by blunt objects, broken glass, dull knives, etc.

*Presented before the Surgical Faculty, Tulane University, April 24, 1928.

†From the Department of Surgery, School of Medicine, Tulane University.

a. Contused wounds: A contused wound is a lacerated wound, the edges of which are irregular, but one which is associated with considerable bruising of the adjacent tissus. It is caused, almost invariably, by blunt objects, non-penetrating in character. The skin is opened virtually by rupture. The tissues adjacent to the wound are crushed and considerably devitalized.

b. Gunshot wounds: By this type of wound is meant the one in which there is considerable laceration, due to the explosive character of the bullet. There is a great deal of difference among the various types of gunshot wounds, depending upon the physical properties of the bullets. A steel-jacketed bullet produces a small, narrow channel in its passage through the body. If the bullet is of softer composition, however, because of the "mushrooming" effect produced, considerable more trauma and contusion is caused. In such wounds articles of clothing are especially apt to be carried into the depth of the wound. Here also, because of the deep wound, and the trauma inflicted, the danger of anaerobic infection is relatively great. Gage[2] has demonstrated that clothing in a wound is a possible cause of anaerobic infection.

B. CLASSIFICATION ACCORDING TO THE BACTERIAL CONTENTS

Wounds may also be classified according to their bactrial contents in the following ways:

1. *Sterile wounds:* In considering sterile wounds it must be kept in mind that in all probability no wound is ever bacteriologically sterile, so it is necessary to differentiate between bacteriologically and surgically sterile wounds. The surgically sterile wounds are referred to in this group. These wounds are those made by the surgeon with sterile instruments under aseptic precautions. They are incised wounds. The amount of trauma is minimal, as in the incised wounds above described.

2. *Contaminated wounds:* A contaminated wound is one which is made under unsterile conditions and one which contains micro-organisms, but one in which the organisms are present only as foreign bodies and are potential causes of an infected wound. Meyer[3] states that anaerobic bacteria begin to grow in the tissues between the seventh and eleventh hours after the production of the wound, whereas aerobic organisms may not become established until the eighteenth to the forty-eighth hour. A contaminated wound, because of the presence of the organisms in it, may pass into the next type of wound, the infected wound.

3. *Infected wounds:* Infected wounds are those which contain micro-organisms which are growing and developing not only in the wound itself but also in the surrounding tissue. Because of this penetration into and the growth of micro-organisms in the tissues, there is a reaction between the host and the invading organisms. It may be seen that the difference between contaminated and infected wounds is principally one of time. Clinically, it has been arbitrarily taken that after 8 hours (Gaudier[4]) a contaminated wound becomes infected, which is an agreement with Meyer's findings, *i. e.*, after this period of time the micro-organisms begin to invade the tissues and are not present merely as mechanical foreign bodies.

SIGNS AND SYMPTOMS OF WOUNDS

All wounds have, more or less, the same signs and symptoms in common, which vary usually only in degree. The principal ones are pain, bleeding, and gaping of the wound.

As a rule pain is the earliest symptom and the one most frequently encountered. The degree of pain varies considerably, according to the type of wound. The pain is minimal in the incised wound and maximal in the contused and lacerated wound. The sensitivenesss of the various parts of the body differ considerably. There also is a normal variation among different individuals. Wounds in inflamed areas are more painful than those in non-inflamed areas.

Hemorrhage: Hemorrhage is found in practically all wounds. There are, how-

ever, exceptions to this rule, as in a wound of the cornea, where, because of the relative avascularity, there is no hemorrhage. Hemorrhage also varies according to the type of wound. In the incised wound the hemorrhage is maximal, whereas in the contused and lacerated wound hemorrhage is relatively slight. In the latter wound the vessels are crushed and are apt to be occluded. The amount of hemorrhage may vary considerably, depending upon the size and type of the vessel injured and also the general condition of the patient. Arterial hemorrhage, recognized by its spurt-like character of bright red blood, is greater than venous. In individuals with a hemorrhagic tendency, as in hemophilia, hemorrhage is a great deal more severe than in normal persons. Wounds in those parts of the body richly supplied with blood, as the head and face, bleed more profusely than wounds elsewhere. Hemorrhage may be, and usually is, one of the most prominent signs of wounds, and is probably the most important immediate factor.

Gaping of the wound depends largely upon its location, the amount of tension present in the particular part, and the character, as well as the size, of the wound.

Shock: In cases with extensive wounds, especially those of the contused and lacerated types shock is apt to be the most important part of the clinical picture. The onset is abrupt; the patient presents all the characteristics of clinical shock; such as a rapid, easily compressible pulse; hypotension; decrease in the body temperature; cold and clammy perspiration and apathy. The exact cause of this type of shock is not known. Whether it is due to a histamine-like reaction, as the result of absorption of toxic products produced in the injured part (Dale[5]) or due to the vasodilator action produced by injury of the erythrocytes, as suggested recently by Phemister and Handy,[6, 7] is not known. It has been shown, both clinically[8, 9] and experimentally,[10, 11] that this type of shock may be prevented by placing a constrictor on the injured member above the contused area. Shock may, however, be caused by hemorrhage. Here, however, the clinical picture is different in that the shock comes on relatively late and always follows considerable loss of blood.

SURGICAL PATHOLOGY OF VARIOUS WOUNDS

Abrasions: The exudative fluid which accumulates on the surface of an abrasion becomes coagulated very early, forming a thin covering over the wound. This clot, according to Frantz[1] is attached to the wound by fibrin stands which pass down between the cells of the underlying corium, thus keeping the clot in immediate contact with the wound. This protective covering is called a "pellicle," which term is applied as long as the clot is attached to living cells by means of unbroken fibrinous strands. Dilatation of the superficial vessels occurs as well as the migration of leukocytes to the part. The devitalized cells are destroyed by a process of autolysis and removed by phagocytosis. The epithelium, in the meantime, has begun to grow in from the edge of the wound, as well as from the deep inter-papillary projections of the germinal layer. As the epithelium grows, granulation tissue takes the place of the connective tissue and blood vessels which had been destroyed. The pellicle should be left undisturbed until its function has been served, when it becomes separated from the underlying structures by a process of autolysis, after which it is spoken of as the crust. Frantz[1] considers the function of the pellicle as protection from bacterial contamination, protection from drying of the deeper parts where repair is in progress, and a drawing together by contraction of the surrounding wound edges. If the pellicle is removed too early bleeding occurs from the capillary tufts. Frantz[1] feels that a distinction should be made clinically between the pellicle and the crust, the former being connected by fibrin strands to the living cells, whereas the latter is only adherent to the wound edges and has relatively little function.

Incised wounds: In order to understand the surgical pathology of incised wounds, it is probably desirable to consider the manner in which a clean aseptic incised wound heals, the so-called healing by first intention. Healing by first intention occurs in surgically sterile, incised wounds in which the edges have been approximated. As a result of the trauma a necrosis of the adjacent cells, even though minimal, takes place.[1] This can be seen within less than an hour after the injury. The elastic tissue and blood vessels retract from the wound. Due to the opening of the blood and lymph vessels, there is an exudation of both blood and lymph into the cavity of the wound. After about eight hours repair begins to take place in the wound. The traumatic degeneration of the cells has reached its height. The small space between the two edges of the wound is filled with a clot composed of erythrocytes, fibrin, and leukocytes.[12] At about this time a swelling of the nuclei of the connective tissue cells can be seen. Within the next 24 hours numerous mitotic figures are seen in the surface epithelium and connective tissue. Fibroblasts, together with small capillaries, pass into the clot from the wound edges. At about the end of four days the wound becomes covered with epithelium, and the clot becomes almost completely replaced by granulation tissue. By the sixth or seventh day the wound is filled with a cellular and vascular tissue. The fibrin becomes removed by the phagocytic, mononuclear leukocytes. By the end of three weeks a dense, non-vascular scar is formed, due to the deposition of collagen fibers by fibroblasts.

In wounds in which the edges have not been coaptated healing occurs by secondary intention, which does not differ materially from that of first intention. The difference between healing by first and second intention is largely one of degree. In the latter type the amount of exudate is greater and depends upon the size of the defect. The amount of granulation tissue, and, therefore, the amount of fibrosis is greater and the time of healing is longer than in wounds which heal by primary intention. Wounds in which the edges are widely separated, so much so that there is no possibility of connecting the wound edges, heal in a more extensive way through the medium of granulation tissue. If such a wound be protected from drying, after 24 hours the edges of the skin are red and swollen. At the end of 48 hours the wound presents a jelly-like appearance, and small reddish elevations of granulation tissue are visible. From such a wound exudes a serous or purulent fluid, which is rich in serum, fibrin, leukocytes, and red blood cells. By the sixth or the seventh day the entire wound becomes filled with these pinkish elevations, of capillary loops, and fibroblasts, which have extended up to attempt to fill the defect.

During the first 24 hours there has been an increase in the size of the wound. Then, varying from a few hours to a day, it remains stationery, following which the wound rapidly decreases in size. It increases in size more rapidly for the following two or three days than subsequently. By the third to the fourth day evidence of epithelial proliferation can be seen. As the wound heals collagen fibrils become deposited with the production of the scar, over which epithelium extends. In this scar there are no evidences of sweat glands, sebaceous glands, or hair follicles. The scar, which is at first pinkish red later becomes white, probably due to avascularity. Carrell and Hartmann[13] found that the rate of cicatrization is greater at the beginning than at the end of the period of repair. This cicatrization depends upon the size of the wound and the rate varies directly with the area. Du Nouy,[14] working under Carrell's direction, showed that the rate of cicatrization of sterile wounds could be determined by means of a mathematical equation. He[15, 16] also found that the rate of cicatrization varied with the age of the patient and the size of the wound. Carrell and Du Nouy[17] found that a latent period of cicatrization existed in sterile wounds, varying from five

to seven days, after which time contraction of the wound occurred rapidly. Howes, Sooy, and Harvey[18] determined the tensile strength of wounds, and concluded that the healing of wounds could be plotted by a curve. They found a lag for from four to six days followed by a phase of "fibroplasia" which rose rapidly at first, then more slowly, until after about ten to fourteen days the maximum strength of the wound is reached. Working with experimentally produced wounds Carrell[19] found that if a wound were protected by a non-irritant dressing no granulation tissue formed nor any cicatrization occurred for twenty-five days at least. The applications of certain irritants locally reduced this period to two days. Carrell concludes, from these experiments, that regeneration is initiated by external and not internal factors. Brownlee[20] observed the rate of healing in the wounds of patients and also in experimentally produced wounds. He found that from the time of the production of the wound a certain latent period is observed in human beings and in experimental animals. This latent period usually persists for six days before the reaction appears. From this time on healing occurs at about the same rate until, after about twenty days, the rate of healing becomes very much more rapid, so that the wound is healed within a relatively short period of time. Brownlee[20] has been able to construct a formula demonstrating the healing of wounds. Burrows[21] has shown that the healing of the wounds, as described above under the healing of secondary intention, may not always occur in sterile wounds or relatively non-infected wounds. He found that after the production of a wound that the wound edges would gap somewhat. After from six to twenty-four hours these edges become fixed, and then begin to move, at first slowly and then more rapidly, toward each other. The structures which tend to close the wound are the dermis, the epidermis, and a few attached fibers of the superficial fascia. This forward movement of the skin leaves a dead space between the skin above and the deep fascia below. At this stage, no evidence of activity in the connective tissue cells can be observed. The epithelial cells are, however, very active. Following this moving forward of the skin, the connective tissue cells become active and begin to proliferate. They fill in the gap between the skin above and the deep fascia below. Burrows believes that this is the type of healing that occurs in those parts of the body where the skin is freely movable.

Girgoloff[22, 23] divides the healing of the wounds into three stages: the first, or preparatory period, is that in which, due to the injury, the solution of the continuity of tissues and the coagulation of extravasated blood and lymph occurs. In this period two zones can be demonstrated; the one of passive destruction and the other of active regeneration. The second period begins a few hours after the first, and may be called the first stage of regeneration. It is characterized by an increase in hydrogen-ion concentration, *i. e.*, a local acidosis. This acidosis begins very suddenly, increases for 48 hours, and then gradually decreases. To this stage belongs the development of granulation tissue and the formation of precollagenous and collagenous fibers. The third period is that of true scar formation. The contraction of the scar occurs, and the wound again becomes alkaline. The collagenous fibers, as well as the elastic fibers, reach their full development.

PHYSIOLOGY OF WOUND HEALING

In addition to the above mentioned works of Brownlee, Burrows, and Girgoloff, the following comparatively recent studies are important in regard to the physiology of wound healing: Schoenbauer and Whitaker[24] demonstrated that the removal of the adventia of the vessels supplying a part favored the healing of experimentally produced wounds. Rieder,[25] on the other hand, found that a periarterial sympathectomy produced very little change in the rate of blood flow through an extremity and, therefore, exerted little influence on wound heal-

ing. Herrmannsdorfer,[26] working in Sauerbruch's clinic, has shown that wounds heal better when the patient is fed an "acid diet." The foods which he believes are acid are meat, eggs, fish, butter, lard, cheese, rice, corn, bread, nuts, cocoa, meat extracts, and beer. Clark[27] found that diet had little effect on the contraction and epidermization of wounds. The latent period was, however, altered by diet, it being prolonged by a fat diet and practically abolished by a protein diet. Nather and Jalcowitz,[28] with this same idea in mind, observed a large number of patients treated with ammonium chloride internally and found that in cases of surgical infection beneficial effects could be produced by the acidosis so obtained. Gaza and Brandi,[29] attacking the problem in a somewhat different manner, irrigated wounds with alkaline and acid solutions. They came to the conclusion that in the acute processes, especially infections, that acid solutions were more beneficial, whereas in the chronic processes alkaline solutions gave the best results.

In the German literature there has been considerable controversy as to whether wounds, especially granulating wounds, have an electrical potentiaiity. In 1918 Melchior and Rahm[30] demonstrated an electrical current in granulating wounds. Beck,[31] on the other hand, was unable to corroborate Melchior's and Rahm's work. Recently, Harzen and Nissniewitch[32] have found that in granulation tissue originating only from the skin and subcutaneous tissue there was relatively little electrical potentiality. On the other hand, that coming from muscle has a relatively great potentiality.

As a stimulant for granulation tissue weak solutions of silver nitrate and balsam of Peru, usually in castor oil, have been used clinically with very good results. Davis[33, 34] recommends the following as a stimulant to granulation tissue: "Clean and dry the granulations and swab the entire surface with a saturated solution of nitrate of silver; over this paint one or two coats of tincture of iodine and expose to the air and light. Finally, dress with balsam of Peru, 1 part, castor oil, 3 parts, on old linen, and carry out this procedure each day."

In 1904 Fischer[35] found that ointments of scarlet red and Sudan III had a specific stimulating effect on epithelium, when injected subcutaneously in the ears of rabbits. Schmieden,[36] in 1908, first introduced an 8 per cent ointment of scarlet red into surgical use as an epithelial stimulant. Davis[33, 34] has used this dye in a large series of granulating wounds and recommends its use. The stimulating action is due to the staining of the fat in the basal layer of the skin (Cone[37]). Gurbski[38] observed intoxication following the use of scarlet red in large wound infections. For this reason he warns against its use. Strauch,[39] on the other hand, believes that unless scarlet red is used in fresh wounds in which there is relatively little granulation tissue, where it is rapidly absorbed, and in large surfaces, the danger of absorption is relatively little. Frantz[1] states that there is no experimental proof showing that scarlet red is an epithelial stimulant, but the clinical results would seem to justify its use. If the dye is used it is best used according to the technic of Davis. The ointment is not applied over the entire wound, but is limited to the edge of the epithelium. After 48 hours this ointment is replaced by a bland ointment for 48 hours following which time the scarlet red is again applied to the epithelial edge.

TREATMENT OF WOUNDS

The treatment of wound depends primarily upon the stage, or the time at which the wound is seen, and also upon the type of wound, classified according to its bacteriological content. It is important, before undertaking the treatment of any wound, to ascertain the general condition of the patient, whether he is in shock, and to determine the amount of hemorrhage. The wound is immediately covered with a sterile dressing, and if considerable hemorrhage is present a compression bandage is

applied. If the patient is in shock, he should be treated for his shock after the hemorrhage has been arrested temporarily, before anything further is done to the wound. Following this, a careful examination of the part, *not the wound*, should be performed in order to determine whether there is any injury to either nerves or tendons. Examination of the part and not the wound is emphasized, because very frequently the possibility of a tendon, nerve, or vessel injury is not considered, and one's attention is directed only to the wound. An injury to the above mentioned structures may be completely overlooked. In contaminated wounds the possibility of the mechanical cleansing of the wound by a mechanical removal of the devitalized tissues, as well as the microscopic and macroscopic foreign bodies, including micro-organisms, is possible. This is the procedure of choice in all cases in which there is considerable devitalization of the part, as the devitalized tissue favors the development of organisms and the development of an infection. Martin[40] states that in the presence of a foreign body an infection is apt to persist. Certain organisms, especially the anaerobes, are virtually saprophytes in that they grow best in devitalized or necrotic tissue. It is absolutely imperative in all cases of contaminated wounds with injury to nerves and tendons to perform a debridement at the time of the primary nerve or tendon suture. It is also desirable in the incised wounds to do a debridement, even though the danger of an infection developing is relatively little, especially in those parts which are well supplied with the blood. The possibility or the danger of a resulting infection or scar is thus greatly minimized.

Laary,[41] in 1914,? suggested that a debridement be done. Debridement, however, was not practiced very widely until the World War, when Gray,[42] in 1914, in the British Army, and LeMaitre[43] in the French Army, began this method of treatment. Experience in the late World War demonstrated that in wounds which were properly excised, primary healing was obtained in 80 per cent, whereas in those in which the debridement was incomplete there were 100 per cent failures (Maes[44]). That better results might be obtained in civil surgery is self-evident. The desirability of mechanical sterilization has been emphasized by Dehelly,[45] Depage,[46] Pool,[47] and others. Of 523 wounds of the head, face, feet, and hands reported by Depage in which a debridement had been followed by primary suture there was complete success in 473 cases, or 96.3 per cent, partial success in 8 (1.6 per cent), and failure in 10 (2.1 per cent). Of 99 cases of primary suture reported by Pool, there were 93 successes and 6 failures. It is now generally agreed that a contaminated wound (one seen within 8 hours after injury) is best treated by debridement. Among war surgeons there was some controversy whether such a wound after debridement should be closed immediately or after a period of days, at which time it could be determined whether the wound was going to be infected or not. Duval,[48] in order to avoid some of the undersirable results obtained following primary suture, advocated covering the wound with sterile dressings following debridement and delaying suture until the bacterial content of the wound had been determined. He found 77 per cent of wounds debrided within the first six or seven hours after injury remained sterile under aseptic dressings. Pool[47] states that wounds of the scalp, face and hands can be closed by primary suture, whereas wounds involving the musculature of the thigh, buttocks, and calf are best treated by delayed primary suture. That better results are obtained by delayed primary suture in war wounds of the soft tissues is shown by Depage's statistics. Of 1,447 such wounds, all treated by debridement, 380 were sutured immediately, resulting in complete success in 83.9 per cent, partial success in 6.3 per cent, and failure in 29.8 per cent. Of 222 treated by late primary suture there was complete success in 93.2 per cent, partial success in 3.6 per cent, and failure in 3.2 per cent. Depage states that

primary suture should not be the rule, 1. When the lesion dates back more than 8 hours; 2. When the patient has been already subjected to previous surgical examination; 3. When the lesions involve deeply the muscular masses and when the tissues are much soiled and lacerated."

Pool believes that a primary suture is contraindicated unless the patient can be observed.

Debridement and early suture is especially indicated in compound fractures and when there is an associated tendon or nerve injury. Open fractures and injuries to joints should be closed as soon as possisble. Following thorough debridement Depage believes that unless there is a minimum amount of soft parts, as in the arm and forearm, a primary suture should be done in compound fractures. In tendon and nerve injury debridement, combined with immediate suture of the divided structures, gives by far the best results.

The technic of debridement consists of excision of the wound edges and all the devitalized tissues down to healthy bleeding non-devitalized areas, under sterile precautions. The extent of the debridement should be such that active bleeding is encountered. Following the removal of the devitalized tissues, together with all foreign bodies, the instruments used to remove them are discarded and fresh, sterile ones taken. Any injury to tendons or nerves are sutured at the time. Debridement must be thorough and complete. Following this, the wound is closed in layers. All dead spaces are obliterated. A dry dressing is applied. Dehelly[45] emphasizes the following points: (1) "The closure must be as complete as possible; (2) The stitches should be without exaggerated traction; (3) Under the cutaneous suture no cavity must be left in which secretions can accumulate. The secretions accumulated in the cavity constitute a very good medium for the culture of the bacteria." In those cases in which there has been tendon injury Harmer[49] advises early institution of function. He urges immediate active motion in cases of sutured tendons in which there is no coincident nerve injury. If no nerve suture has been done, he employs no splint. If, however, a nerve has been sutured, an appropriate splint is applied, which relieves the nerve of any tension, but still allows function of the fingers. If the functional post-operative treatment as advocated by Harmer, is to be practiced, it is essential that a satisfactory tendonorrhaphy be performed. Harmer[50] employs the following technic: "The sutures are silk and consist of overcasting the lateral margins of both ends of the divided tendon. The overcasting starts about the width of the tendon, or a little more, back from the point of division and comprises several whippings about the side of the tendon down to the line of division, each including somewhat less than one-fourth of the circumference of the tendon. When the tendon is ready to be brought together each end then carries two stitches and each edge two ends. The two parts of the tendon are now brought together and the two suture ends nearest the line of adhesion on one side are tied. The two pairs of such ends on the other side are then similarly tied. The long ends tied along the side of the tendon serve as a lateral splint."

In employing motion immediately after a tendon suture it is essential that only active motion should be allowed, and then executed only to the point of pain. Any movement in excess of this is apt to cause a tearing of the suture. Stokes and Tytler[51] have demonstrated that in gunshot wounds the narrow track which has been produced by the bullet passing through an extremity without striking the bone is usually sterile. If an infection does occur, it is apt to involve the exit opening.

(To be continued)

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Manuscripts should be addressed to the Editor, 1551 Canal St., New Orleans, La.

COME TO NEW ORLEANS.

The Annual Meeting of the Louisiana State Medical Society will start in a few days. We earnestly urge that you make every effort possible to get to this very important convocation. The Fiftieth Anniversary of the organization is to be celebrated, and it will be celebrated in a manner which will be most eventful. The meeting will be historical; it will go down in the records of the State Society as one of the greatest that has ever been held. The special efforts that are being made by the Committee of Arrangements under the able Chairmanship of Dr. Paul J. Gelpi are being made for the express purpose of making this, the Semicentennial of the birth of the organization, a birthday celebration which will always live in the memory of the celebrants. So put aside your work for a few days; disregard the importunities of the patient; come down to New Orleans; help to make this meeting what the New Orleans doctors are determined to make it: the most successful yearly gathering in the history of the Society.

A REGISTRY FOR TECHNICIANS.

As the number of medical men proportionate to the general population has decreased the demands for certain services of medical nature have increased. The natural sequence of events is that many individuals not trained as physicians have been called to take part in medical practice. The demand is particularly in those branches of medicine where work of a more or less routine standardized nature is necessary, such as the setting up of Wassermann tubes, the making of culture-media, the developing of Roentgen films, and similar laboratory procedures. As a result of the information that has been acquired by a certain amount of technical training, in laboratories of clinical pathology and roentgenology, many men and a few women without the degree of doctor of medicine have set themselves up as qualified to conduct these types of laboratories. The abuse has grown to such an alarming extent that many measures have been taken and are being put into effect by organized medicine to control these non-medical laboratories, whose bare existence is utter absurdity. The American Society of Clinical Pathologists has taken steps not only to combat this evil, but also to elevate the status of the laboratory technicians to that of a respectable and useful calling. Their method of approach of this problem has been to organize a registry of technicians, with rules under which those qualified by education, technical instruction and moral character will receive a certificate. These technicians agree to work at all times under the supervision of a qualified physician, and shall under no circum-

stances on their own initiative render written or oral diagnosis. They shall not advise physicians in the treatment of disease or operate a laboratory without the support of a qualified physician.

The headquarters of the Registry of Technicians, the American Society of Clinical Pathologists, are located in the Metropolitan Building, Denver, Colorado. Physicians requiring technical assistance would do well to get in touch with these headquarters and to employ whenever possible an individual whose qualifications have been certified by this Society.

CHILD WELFARE EXTENSION SERVICE

The Sheppard-Towner Bill recently repealed, now recreated and brought before the House of Congress for reconsideration, has so many features objectionable to the physicians that it is difficult to understand just why there are any doctors at all who are willing to encourage this piece of pernicious legislation. The original act has been in effect for seven years, during which period of time $12,000,000 was spent by the United States Government. The proponents of this new bill can offer no evidence of anything accomplished by this expenditure, except possibly the payment of the salaries of a few public health nurses and bureau employees who have lived happily on the federal salary. This piece of legislation is against the interest of physicians. There is absolutely no reason for furnishing free medical services by the Federal Government any more than it should furnish a house for nothing or free fuel. Child hygiene is an integral part of general hygiene. To establish a bureau in a center like Washington, remote from many sections of the country, which will endeavor and which will attempt to control child hygiene throughout the country, is ridiculous and wanton extravagance. Government of the States and by the States should be insisted upon in matters which pertain to purely local affairs, from the standpoint of economy and freedom from centralized bureaucracy.

The whole question is essentially medical. It should not be made an economic nor a political question. The management of the bureau should not be in the hands of a lay individual, as it has been in the past, who has seen to it that the control of obstetrical facilities, of midwives, of prenatal centers is almost entirely through lay agencies. It is the height of folly to attempt, through prying and questioning busybodies, to control local medical matters from the national capital and to put in the hands of the laity important problems which have to do entirely with medical practice.

THE PROMOTION OF THE COMMON WELFARE; THE AIM OF MODERN MEDICINE.—But it is not enough that medical science should discover, declare, and then let go. If it would fulfill its destiny and carry out its high purposes and resolves it must participate actively in the co-ordination of its own with the best offerings in religion, law, politics, ethics, and all sciences. This carries the physical beyond the confines of a strictly professional life, and he must assume and perform extra-professional duties of the most far-reaching importance. These duties are no less than those of the citizen, and it is at this point that medicine broadens its opportunities for public service. Every major interest of medicine has a merging point with the common interest, and the physician who does not see that the mortise is accurately fashioned and the tenon well set must be responsible for the failure of the jointure. It should not be inferred, however, that the physician must devote all of his time, consecrate all of his energies and exercise his hard-bought skill exclusively for the public good. There is a secondary duty of self-interest and economic necessity which allows him to make and to store for his household, and the physician who fails in this is at a disadvantage in rendering the largest service to the public. It is less likely that the physician will fail in this instance than that all will voluntarily deprovincialize themselves and assume the habiliments of the public citizen. —Bathurst, W. R.: South. Med. Jour., 22:1, 1929.

HOSPITAL STAFF TRANSACTIONS

CHARITY HOSPITAL SURGICAL STAFF.

A moving picture showing the movements of the gastro-intestinal tract was found to be of interest. The picture showed the peristaltic movements as observed in the dog, cat, and rabbit under ether anesthesia, and following stimulation of certain nerves.

Dr. E. L. King presented two very interesting specimens. The first was that of a ruptured uterus, removed from a patient who had, at a previous pregnancy, been subjected to a caeserian section. In this instance an early diagnosis was made and the patient operated on immediately. It was found that the uterus was adherent to the abdominal wall on each side of the ruptured scar. Dr. King explained that this probably saved the patient's life. It is interesting to note that the caesarian operation, mentioned above, had been done for the patient's ninth pregnancy—and for a dead fetus. At the present time Dr. King did a supravaginal hysterectomy and the patient made an uneventful recovery. Unfortunately, the baby had been dead, apparently, for several hours.

The second specimen shown by Dr. King was a caesarian section scar. The patient had a contraced (rachitic) pelvis, and she was not permitted to go into labor. This was quite a fortunate procedure, as at the operation the scar was removed and found to be nothing but endometrium and peritoneum. Dr. King ventured the opinion that one good contraction would have caused the scar to rupture.

The first case of the evening was discussed by Dr. J. A. Danna. It was that of a young colored female who had been shot in the abdomen at the lower border of the ribs on the right side, and about on the nipple line. Operation revealed a perforation of the right lobe of the liver and laceration of the neck of the gall-bladder with a slight contusion of the second portion of the duodenum. The gall-bladder was repaired and drained. However, the patient died two days later of general peritonitis.

Dr. Danna pointed out the great difficulty encountered in dealing with this type of case. Dr. Graffagnino recalled, in his discussion, that a special committee had done much to clear up some of the difficulties met in these cases. He explained that blood pressure readings, transfusions, etc., were all necessary parts of treatment in these cases, and may often mean the difference between life and death.

Case number two was one of pernicious vomiting of pregnancy. The patient was a white female, 27 years of age. Usual care was given; but in spite of this she aborted and developed a sub-involution of the uterus. The next day she died. Autopsy revealed a right pyonephrosis, acute cystitis, post-abortal sub-involution, retained products of pregnancy, toxic myocarditis, hepatitis, and splenitis; and edema and congestion of the lungs.

Dr. R. L. Gordon pointed out the great necessity for the genito-urinary consultations in these cases, and expressed an opinion that cystoscopy might have helped in this case. To the writer it appeared that, in the later stages, this might have been a case of uremia; and that the vomiting persisted because of her acute genito-urinary condition. However, Dr. Hilliard Miller felt that the case was particularly one of pernicious vomiting with the genito-urinary condition a simple complication.

A white female, 37 years of age, who died following an apparently normal and easy delivery, was the basis for the next discussion. Dr. W. P. Gardiner pointed out that this was one of a small percentage of cases which are bound to die. He added that unseen and unsuspected lacerations through the cervix and into the uterine musculature may be easily overlooked. In this particular case, it must be added, the placenta did not separate; and had to be removed later manually. Dr. Kostmayer expressed his opinion that this was just a pure case of post-partal hemorrhage, as she bled quite profusely after delivery, and that it was imperative that the placenta be removed manually if any definite knowledge of the bleeding was to be obtained.

FRANK L. LORIA, M. D.

PROCEEDINGS OF THE HOTEL DIEU STAFF.

The regular monthly meeting was held February 18, 1924, Dr. J. T. Nix presiding, Dr. Lucien A. LeDoux, Secretary, at the desk.

Case presentations: 1. By Dr. P. Leonce Thibaut: Open reduction of complete dislocation of outer end of right clavicle. C. S., a white male, was injured December, 1927, while riding on ladder of freight car was struck by car going in opposite direction.

The patient was operated upon April 10, 1928, and ordered to light work June 21. Returned to regular work, switchman, January 2, 1929.

Patient was exhibited to the Staff, showing complete function re-established.

This case was discussed by Drs. M. Gelpi, J. Danna and Lucien A. Fortier.

2. Dr. Homer Dupuy and Dr. Jules Dupuy presented two cases of laryngeal stenosis, one case intubated, the other tracheotomized, and admitted to the Hotel Dieu within twenty-four hours.

Both young patients were exhibited before the Staff, and these interesting cases were discussed by Drs. J. Dupuy, Val Fuchs, J. Danna and M. Meyer.

Discussions of the deaths occurring in the hospital during the preceding month completed the scientific part of the meeting.

LUCIEN A. LEDOUX, M. D., Secretary.

FRENCH HOSPITAL.

The regular meeting of the French Hospital Staff was held on Friday, February 8, 1929, Dr. T. A. Jung presiding. Those present were: Drs. T. A. Jung, E. L. Zander, Ed. McCormac, M. Lescale, D. N. Silvermann, H. Meyer, J. N. Ane, E. N. Haller, P. Graffagnino, J. J. Baron, M. J. Lyons, W. H. Harris, R. J. Gordon, G. D. Sagrera, A. M. Powe, L. L. Cazenavette, F. J. Beyt, E. J. Tucker, L. J. Menville, F. A. Planche, G. C. Anderson, S. C. Lyons.

A symposium on appendicitis was held. Dr. S. C. Lyons spoke on the Surgical Aspects of Appendicitis, stressing the following points: 1. The necessity of instructing the general public in regards to appendicitis. 2. In acute appendicitis, immediate operation gives excellent results; delayed operation disastrous results.

Dr. E. McCormac talked on Differential Diagnosis of Appendicitis in Relation to Urology. He advised the following procedure when a patient had pain: 1. That roentgen-ray pictures be made of the patient in erect and lying positions. 2. That a urinalysis be made with examination for organisms. 3. That a phthalein test be made.

Dr. D. N. Silvermann spoke on the Medical Aspect of Appendicitis. 1. The difficulty of diagnosing chronic appendicitis. 2. The continuation of gastro-intestinal symptoms following appendectomy. 3. The necessity of surgically removing the appendix when diseased.

Dr. L. J. Menville spoke of the Value to the Roentgen-ray in Diagnosing Appendicitis. 1. In locating the appendix and in determining its position. 2. In determining the aspect of the region in which the appendix is located.

Dr. W. H. Harris spoke on the Pathology of Appendicitis. He outlined the possible causes of appendicitis and the resistance of tissues, and advocated the removal of the appendix before there was an involvement of the serosa.

Dr. P. Graffagnino opened the discussion. He stressed the importance of diagosis in appendicitis.

The floor was opened to general discussion; those taking part were: Drs. L. J. Menville, E. L. Zander, G. C. Anderson, W. H. Harris.

There being no further business the meeting adjourned.

VICKSBURG SANITARIUM AND CRAWFORD STREET HOSPITAL STAFF MEETING.

The regular monthly meeting was held March 11, 1929. Dr. A. Street presented the first case, one of gastro-jejunal ulcer. This patient, a white female, 54 years of age, had a gastro-enterostomy for a large duodenal ulcer two and one-half years previously. Six weeks prior to her admission to the hospital she began to have continuous abdominal pain in the right upper quadrant and lower abdomen, associated with persistent nausea, occasional vomiting, and hunger pain.

After preliminary treatment she was operated on with resection of the gastro-enterostomy opening, and at the time of the report was convalescing comfortably.

The second case was one of post-partum eclampsia, presented by Dr. G. M. Street. Because of marked general edema, hypertension and albuminuria labor was induced at eight and one-half months and a normal eight-pound female child delivered in nine hours. The following morning she had the first convulsion and one hour later a second convulsion. She was given 20 per cent magnesium sulphate solution intravenously and morphin, and then 10 per cent glucose solution intravenously. The patient made an uneventful recovery.

Dr. J. A. K. Buirchett, Jr., showed a case of compound fracture of the forearm caused by a crushing blow. The muscles of the right forearm were ruptured transversely, the skin being pulled away from the subcutaneous tissue for two-thirds of the circumference of the forearm. The wound was cleaned of crushed tissue and treated with Dakin solution and iodin. Sutures were placed in the skin and the arm placed in a plaster splint in slight flexion. A slight infection has cleared up, spongy union is beginning, and a 50 per cent result is expected.

Dr. L. J. Clark presented a case of paroxysmal tachycardia in a white female, 51 years of age. The irregularity was said to have been present at intervals since 16 years of age. The case was seen in an attack on the third day following a cholecystectomy. She had been taking digitalis. This was discontinued and sparteine sulphate, grains two, was given every three hours. In forty-eight hours the normal rhythm was resumed.

The effect of the sparteine is problematic.

A case of septic meningitis following a chronic mastoiditis was offered by Dr. H. H. Johnston. The spinal fluid showed 1456 leukocytes with 96 per cent neutrophiles. Anti-meningococcic serum was used intra-spinally and intravenously. The cultures from the spinal fluid and blood stream showed a streptococcus of the non-hemolytic type. A left mastoidectomy was done and a large abscess drained; the pus containing the same non-hemolytic streptococcus. The patient died ten hours later. Autopsy showed a cerebral hepto-meningitis with a sub-dural collection of pus over the left frontal region. The left lateral sinus was thrombosed.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

During the month of March besides the regular meeting of the Board the Society held one scientific meeting and one joint clinical meeting with the Charity Hospital Staff.

At the scientific meeting the program was as follows:

"The Prevention and Control of Tuberculosis in Children," by Dr. E. A. Bertucci. Discussed by Drs. Wallace J. Durel and E. D. Fenner.

"Gastric Analysis in Congestive Heart Failure," by Dr. I. L. Robbins. Discussed by Dr. Smith.

"The Chronic Appendix from the Roentgenological Standpoint," by Dr. Adolph Henriques. Discussed by Drs. J. H. Musser, S. K. Simon, John A. Lanford, Monroe Wolf, A. Mattes and closed by Dr. Henriques.

Dr. Monroe Wolf presented a case of "Diverticulum of the Urethra."

At the Clinical Meeting held March 25 interesting cases were presented by the members. Dr. Rucker, the guest of the evening, presented "A Report of the First Case of Typhus Fever in Louisiana."

Both meetings were very well attended.

At the scientific meeting the final vote on the amendment to the By-Laws was favorably acted upon and will read as follows:

ARTICLE I.

MEMBERSHIP

Section 2. ACTIVE MEMBERS: Eligibility—Every white physician residing in the Parishes of the First and Second Congressional Districts and a graduate of a regular school of medicine or those so registered by the Louisiana State Board of Medical Examiners, is eligible to active membership, also any white physicican connected with any hospital staff or teaching staff of any recognized Medical School and not actively engaged in the practice of medicine.

The second quarterly premium on group insurance will be due on April 5th and our check must be in the home office at that time. The members are urged to get their checks in the secretary's office not later than April 3rd.

The Committee on Arrangements has been working very hard for the coming meeting of the Louisiana State Medical Society. All sub-committees are working to make the meeting a most successful one.

During this past month the following doctors were elected to membership:

ACTIVE MEMBERS: Drs. J. Henry Bayon, Jr., John B. Gooch, Philip J. Saleeby and Robert F. Sharp.

INTERNE MEMBER: Dr. Ernest B. Weinfield.

REPORT OF TREASURER

Actual Book Balance, 1/30/29	$2,825.42
Receipts during February	1,372.75
Receipts for insurance	1,111.95
	$5,310.12
Expenditures	819.98
ACTUAL BOOK BALANCE	$4,490.14

REPORT OF LIBRARIAN

One bibliography has been added to our files during February—on Diverticulum of the Esophagus. The daily reference calls by telephone and in person have been constant.

Two hundred and seven books have been added to the Library. Of these 16 were received by purchase, 105 by gift, 46 by binding, 24 by exchange, and 16 from the New Orleans Medical and Surgical Journal.

The donors for the month are:

St. Luke's Hospital, Nebraska University College of Medicine Library, Dr. P. T. Talbot, Dr. E. L. King, Cincinnati General Hospital Library, Creighton School of Medicine Library, Dr. D. F. Montague, Grosvenor Library, Buffalo, Dr. C. Jeff Miller and Dr. J. H. Musser.

A list of new accessions of recent date is appended.

NEW BOOKS

Lawrence—Diabetic Life. 1928.

Emerson—Physician and Patient. 1929.

McClung—Microscopic Technique. 1929.

McKittrick—Diabetic Surgery. 1928.

Marriott—Recent Advances in Chemistry. 1928.

Chandler—Lipiodol in the Diagnosis of Thoracic Disease. 1928.

Michigan University—Physical Education Activities. 1928.

Kaye—Roentgenology. 1928.

Chesser—Child Health and Character. 1927.

Ogilvie—Recent Advances in Surgery. 1928.

Rutherford—The Eye. 1928.

Kendall—Bacteriology. 1928.

Chapin—Diseases of Infants and Children. 1928.

Billings—General Medicine. 1928.

Blum—Practical Diatetics. 1928.

Schamberg—Compend of Diseases of the Skin. 1928.

H. THEODORE SIMON, M. D.,
Secretary.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

TO THE MEMBERSHIP:

Our plans for the gala meeting of the Louisiana State Medical Society in New Orleans, April 9, 10 and 11, are now completed. From indications we will have a banner attendance, and with good reason because the Committee on Arrangements has an unusual program for your delectation.

We desire to call your special attention to the extraordinary program on Monday night, April 8, the day that the House of Delegates meets. Dr. Rudolph Matas will present the world renowned Canti films, and all who are able should take advantage of this unusual opportunity.

The semi-centennial celebration will be attractive in many respects. The public has been invited to this function and a very enjoyable evening is promised as orators of note will speak and an unusual artistic program will be presented.

LEON J. MENVILLE, President
Louisiana State Medical Society

Our stag affair on Wednesday night will be made attractive as usual, and no doubt a large number will congregate to recall memories of the past and discuss affairs of the day at the splendid repast that will be served.

The Chairman of the Ladies' Entertainment Committee has likewise prepared an elaborate program, and we hope that the wives, sisters and sweethearts of our members will join us in great numbers.

All is ready for the Golf Tournament. Our Chairman has made extensive preparations and hopes that there will be many contestants. Your attention is particularly directd to the fact that a cup now in the possession of Dr. Larry DeBuys, who won the contest in Baton Rouge last year, will again be contested for; final possession of the cup depending on three successful winnings.

Come one, come all. There will be lots of science, lots of art, lots of pleasure, lots of play and lots of entertainment.

PAUL J. GELPI, M. D.,
Chairman, Committee on Arrangements.

SPECIAL ANNOUNCEMENT.

As the result of arrangement with Station WWL, Loyola University, New Orleans, the Tuesday evening jubilee program will be broadcast by remote control from the Tip Top Inn at the Roosevelt Hotel over this station.

This is the first time that any part of the state meeting has been broadcast by radio, and it is hoped that this medium will be the means of enabling many of the members who are not able to attend this meeting to listen in on the splendid program arranged for that evening.

LUCIEN A. LeDOUX, M. D.,
Chairman Publicity Committee.

NOTICE TO PARISH SECRETARIES

The following parish medical societies have not sent in their officers for 1929, and they are respectfully asked to give this their prompt attention:

Acadia, Bossier, Jefferson Davis, Livingston, Rapides, St. Martin, Union, Vermilion and Washington.

President Edwin A. Alderman, University of Virginia, will deliver the principal address at the ninety-first commencement of the Medical College of Virginia, Richmond, on Tuesday, May 28, 1929.

TULANE UNIVERSITY'S BEHAVIOR CLINIC

A behavior (child-guidance) clinic has been established in connection with the school of social work of Tulane University, New Orleans. A be-

havior clinic examines a child to discover the causes of his misbehavior or mental difficulties and advises the parent or teacher as to how best to help the child to overcome them. In other words, it does for the mind of a child the same sort of service that a child-health clinic does for his body.

Assistant Surgeon F. M. Evans is relieved from duty at Quarantine Station, New Orleans, La., and assigned to duty at Guarantine Station, Rosebank, N. Y.

SPECIAL NOTICE

It was found necessary to publish some of the surgical papers read before the last meeting of the Louisiana State Medical Society without discussions. This was due to our failure to secure from the medical reporter a full copy of the discussions made. To withhold these papers from publication any longer was deemed inadvisable by the Executive Committee.

P. T. TALBOT,
Secretary.

AN ACKNOWLEDGMENT

The paragraph entitled "The Promotion of the Common Welfare; The Aim of Modern Medicine," which appeared on page 665 of the March number was written by Dr. William R. Bathurst, and was an excerpt from the President's Address delivered at Asheville and printed in the Southern Medical Association Journal of January, 1929.

PARISH MEDICAL SOCIETY OFFICERS FOR 1929

The following Parish Medical Societies have elected officers for 1929 as follows:

ST. MARY PARISH

President, Dr. A. C. Kappel, Franklin, La.

Sec.-Treasurer, Dr. T. H. Gueymard, Morgan City, La.

Delegate, Dr. C. M. Horton, Franklin, La.

Alternate, Dr. Louis Crawford, Patterson, La.

CADDO PARISH

President, Dr. J. L. Scales, Medical Arts Bldg., Shreveport.

1st Vice President, Dr. W. S. Harmon, Medical Arts Bldg., Shreveport.

2nd Vice President, Dr. D. H. Alverson, Giddens-Lane Bldg., Shreveport.

Treasurer, Dr. J. R. Stamper, Medical Arts Bldg., Shreveport.

Secretary, Dr. P. R. Gilmer, Medical Arts Bldg., Shreveport.

Delegates: W. P. Butler, M. S. Picard, J. M. Gorton, J. E. Knighton, E. L. Sanderson, Guy A. Caldwell.

Alternates: T. J. Fleming, Louis Abramson, Franke Walke, Edgar Galloway, R. G. Douglas, W. S. Kerlin.

MOREHOUSE PARISH

President, Dr. S. I. Sims, Bastrop, La.

Vice-President, Dr. E. L. Miller, Bonita, La.

Sec.-Treasurer, Dr. L. E. Larche, Bastrop, La.

Delegate, Dr. W. A. Rodgers, Bastrop, La.

Alternate, Dr. R. B. Leavell, Bastrop, La.

IBERVILLE PARISH

President, Dr. R. R. Grant, Plaquemine, La.

Vice-President, Dr. R. D. Martinez, Plaquemine, La.

Sec.-Treasurer, Dr. W. E. Barker, Jr., Plaquemine, La.

Delegate, Dr. W. G. Owen, White Castle, La.

Alternate, Dr. G. A. Darcantel, White Castle, La.

MEETING OF ST. TAMMANY PARISH MEDICAL SOCIETY

The regular monthly meeting was held at the Southern Hotel, Friday night, March 8, at 8 o'clock. Members present were L. Roland Young, H. E. Gautreaux, W. L. Stevenson, H. D. Bulloch and J. F. Buquoi. Lawrence R. Young was a guest and A. L. Magruder an invited essayist of the evening.

In addition to regular order of business, etc., H. E. Gautreaux, M. D., and A. L. Magruder, dentist, entertained with papers, the former having as his subject, "Obstretrics," the latter, "Pyorrhea." These were very much enjoyed and there was much said on both. The Doctor stressed the seriousness of child bearing and the skill that should attend it. The dentist ably detailed pyorrhea and brought forward the pitiful data that only twenty-five per cent was seen early enough to entirely eradicate and layed stress on its prevention stating that it should be handled by both the doctor and the dentist as it was both a constitutional and local disease.

L. ROLAND YOUNG, M. D.,
President and Acting Secretary,
St. Tammany Parish Medical Society

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

J. S. Ullman, M. D., Associate Editor.

TO THE MEMBERS OF THE LOUISIANA STATE MEDICAL SOCIETY

The Mississippi State Medical Association is indeed glad to have the opportunity and the privilege to extend to its neighbor and sister association, the Louisiana State Medical Society, its hearty good wishes and congratulations on its golden anniversary. We sincerely hope that its scientific achievements and its work for the public good will continue to be known among medical men for years and years to come and that the spirit of fraternalism which has existed between our two societies may be maintained throughout the existence of both.

Doctor J. W. Barkley who had two months training at the Public Health Training School at Indianola, Mississippi, last year has been elected full-time director of the Tishomingo County Health Department.

Dr. J. W. Dugger succeeded Dr. R. S. Curry as Factory Inspector on March 1.

Dr. Mark F. Boyd of the Rockefeller Foundation has been employed by the Mississippi State Board of Health as Director of the Division of Malaria Investigation and Control. Doctor Boyd has had experience in this work in many parts of the world.

Mr. George Parker, who has been in charge of Malaria Control Work for the Mississippi State Board of Health, has tendered his resignation effective March 25 to engage in local industry of a manufacturing nature. Mr. Parker has given seven years faithful service to the Mississippi State Board of Health and his resignation was the cause of genuine regret to all those with whom he had been associated in the work.

A forty foot extension is being made to the brick building in the rear of the Old Capitol. This building is used by the Board of Health for the manufacture of biologics. This addition to the building will give enlarged and improved facilities for the manufacture of typhoid vaccine, antirabic treatments, silver nitrate solution, and other biologics prepared and distributed by the Mississippi State Board of Health.

TO THE MEMBERS OF THE COUNCIL:

Are your bearing in mind your responsibility in maintaining and perfecting the organization of the Association?

Have you made your official visits to your component societies? Have you called on your local secretaries for the rosters of members, and checked up last year's membership? Have you a list of physicians in your district who are not members of the Association? An extra letter from you will do much to supplement the local secretaries' efforts in keeping up membership and in bringing in new members.

Gulfport is making preparations for a great meeting, and we want a record attendance. Let nothing prevent your attendance. Bring your "better half." Tell her she owes it to herself to make at least one visit to the "Play-ground of the South." Elaborate preparations are being made to make this a most enjoyable occasion for the ladies, and we would like to see a large attendance.

Drop me a note telling me how things are going in your district, and assuring me that we shall have the pleasure of seeing you at Gulfport, May 14-15-16.

Cordially,

D. J. WILLIAMS,
Chairman Council.

Jackson, Miss.,
March 11, 1929.

To the Ex-Presidents,
Mississippi State Medical Association.

Gentlemen:

This is to remind you that the next State Meeting is almost at hand. Gulfport is an ideal place to spend a few days vacation, and the boys down there are preparing to give us one of the best meetings in the history of the Association. Make your plans to attend, and let nothing prevent you.

The Ex-Presidents' Club is the "aristocracy" of the Association, and the annual reunion is one of its best features. The Club dinner last year was the most interesting event of the meeting for me.

You remember Dr. Rowland's challenge to meet each of you each year for the next ten years. The record had just been read showing that he had missed only two meetings of the Association

in forty-five years. That is the spirit of loyalty that should illumine the path of the younger members and exalt the office of president of the Association.

Let us show the boys that we are still very much alive by attending the meetings and taking an active part in the affairs of the Association.

A later letter and program will be sent you. This is just to remind you that we are counting on you and want you to make your plans to be present at Gulport on May 14-15-16.

Cordially,

(Signed) D. W. JONES, Secty.,
Ex-Presidents' Club.

The Fifth Councillors District has been having District Meetings. The first was held at Jackson with the Central Medical Society as host and the Warren County Doctors as essayists.

The next meeting was held at Vicksburg, the Warren County Society acting as host and the Central furnished the program.

These meetings were characterized by the high quality of the papers presented, the spirited discussions, and the cordial spirit of fraternalism that prevailed. The several members of the two societies became more intimately acquainted, and both local societies were doubtless helped. The plan is recommended to other societies.

(Signed) D. W. JONES,
Councillor.

INTERSTATE POST-GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

This organization announces its American Spring Assemblies from April 15 to May 9, 1929, and European Assemblies from May 18 to July 11, 1929. The officers of the Assemblies are:

President: Dr. John B. Deaver, Philadelphia, Pennsylvania.

President of Clinics: Dr. Charles H. Mayo, Rochester, Minn.

Chairman of Program Committee: Dr. Geo. W. Crile, Cleveland, Ohio.

Managing-Director: Dr. W. B. Peck, Freeport, Illinois.

This year clinics will be visited at Rochester, Minnesota, April 15-16; at Chicago, April 17-19; at Cleveland, April 20-22; Boston, April 23-25; at New Haven, April 26; at New York, April 27-May 1st; at Philadelphia, May 2-3; at Baltimore, May 4-6, and at Washington, May 7-8.

The European Assemblies will visit the following clinics:

May 18—Sail from New York.

May 2 —Arrive at Southampton.

May 27-29—In London.

May 30—Visit English Lakes on way to Glasgow.

May 31, June 1—Glasgow, Scotland.

June 2—Visit to Trossachs on way to Edinburgh.

June 3-4—Edinburgh, Scotland.

June 5—By boat to Bergen, Norway.

June 7-9—Oslo, Norway.

June 11-13—Stockholm and Upsala, Sweden.

June 14—Lund, Sweden.

June 15—To Copenhagen, Denmark.

June 16-18—Copenhagen, Denmark.

June 20-21—Hamburg, Germany.

June 22-24—Berlin, Germany.

June 26-27—Frankfort, Germany.

June 29-July 2—Paris, France.

July 3—Sail from Cherbourg.

July 11—Arrive in New York.

Dr. J. S. Moore of Magnolia died on February 17, 1929, of cardiac disease. His sudden death was naturally a shock to his many friends.

The Journal extends its sympathies to the bereaved family.

Dr. E. P. Dempsey of Potts Camp, Mississippi, is at the Oxford Hospital for surgical treatment.

The April meeting of the North Mississippi Six Counties Medical Society will be held in Oxford.

At a recent meeting of the DeSoto County Medical Society the following officers were elected for the year:

President, J. M. Wright, Hernando.

Vice-President, J. A. Rhodes, Horn Lake.

Secretary-Treasurer, L. L. Minor, Memphis.

Delegate to State Association, L. L. Minor, Memphis.

Alternate Delegate, A. J. Weissinger, Hernando.

Censors: A. L. Emerson, A. V. Richmond, W. S. Weissinger.

The regular quarterly meeting of the North-East Mississippi Thirteen Counties Medical Society, March 19, was held in Okolona, Mississippi.

Their program was as follows:

1. "Mediastinal Abscess Following Injuries to Neck"—E. Q. Withers, Columbus.

2. "Pyosalpinx Complicating Labor"—D. C. Spalding, West Point.

3. "Earache in Children"—Eugene Rosamond, Memphis.

4. "Some of Our Professional and Associational Needs"—W. H. Frizell, President, Mississippi State Medical Association.

5. "Report of Some Unusual Cases"—R. D. Kirk, Jr.

The East Mississippi Medical Society met in Newton February 21. The program was as follows:

1. "The Management of Pneumonia of Infants and Children"—F. G. Riley, Meridian.

2. "The Indications for Operations in Acute Mastoiditis"—Robin Harris, Jackson.

3. "Dental Infection and Diagnosis"—J. M. Brown, Newton.

4. "Epidermophytoses"—R. W. Hall, Jackson.

5. "Angina Pectoris and Coronary Thrombosis"—T. D. Boudreaux, Meridian.

The regular monthly meeting of the Issaquena-Sharkey-Warren Counties Medical Society was held in Vicksburg March 12.

Ey invitation of Drs. Knox, Parsons and Sanderson, the Society visited the new Vicksburg Hospital and enjoyed a clinic session.

A paper was read by Dr. M. H. Bell.

The Staff Meeting of the Vicksburg Sanitarium was held March 11 with the following program:

1. "Gastro-Jejunal Ulcer—Dr. A. Street.

2. "Postpartum Eclampsia"—Dr. G. M. Street.

3. "Compound Fracture of the Forearm"—Dr. J. A. K. Birchett, Jr.

4. "Paroxysmal Tachycardia" — Dr. L. J. Clark.

5. "Septic Meningitis Following Chronic Mastoiditis"—Dr. H. H. Johnson.

6. "Coagulation and Bleeding Time"—Dr. E. H. Jones.

7. "Generalized Melanoblastomatosis"—Dr. L. S. Lippincott.

8. Demonstration of Selected Radiographic Studies:

(1) Calcification of Abdominal Aorta.

(2) Carcinoma of the Stomach.

(3) Suppurative Pleurisy.

(4) Pulmonary Tuberculosis.

(5) Maxillary Sinusitis.

DIAGNOSIS OF EARLY UTERINE CANCER.—Emil Novak, Baltimore, stresses the fact that simple pelvic examination is not sufficient in making the diagnosis in many cancer cases. The physician should, in all suspicious cases, see that cancer is ruled out. This will mean biopsy in suspicious lesions of the cervix, diagnostic curettage in suspicious bleeding from the uterus. If early cancer of the cervix is found, the patient has at least a fifty-fifty chance for cure. If early adenocarcinoma of the uterus is found, her chances of cure should be about two out of three. Any physician can diagnose late cancer, but physicians should familiarize themselves with the clinical appearance of early cancer and of cervical lesions that are to be regarded with suspicion. Even if proved benign, such lesions are important predisposing causes of cervical cancer, and their correction, usually very easy, does much to protect the patient from cancer. The danger of biopsy, if any exists, is far more than counterbalanced by the life-saving information it often yields. There is no other way of making the diagnosis in the early stages of the disease. The same statement may be made with regard to diagnostic curettage in suspicious bleeding of intra-uterine origin. Neither biopsy nor diagnostic curettage is of unqualified value, however, unless combined with competent pathologic examination. The ideal is, of course, that the surgeon himself should be a good pathologist. Although there is much discussion of the bearing on cancer mortality of such factors as the method of treatment and the histologic classification of the tumor, the fact still remains that the most important single factor is the duration of the disease. Hence the basic importance of biopsy and diagnostic curettage which are essential in the recognition of the really early stage.—J. A. M. A., March 16, 1929.

BOOK REVIEWS

Extra Ocular Muscles: By Luther C. Peter, A. M., M. D., Sc. D. Philadelphia, Lea & Febiger. 1927. pp. 294.

This volume is a worthy successor to the author's excellent book on Perimetry. A difficult subject is discussed in a complete yet simple manner by one of our foremost teachers in opthalmology. No book has been written on this subject in recent years which from the viewpoint of the American ophthalmologist is its equal.

The anatomy and physiology of the extra ocular muscles one must learn and forget at least six times to properly understand. The excellent illustrations and the lucid text make this as painless as possible.

Until recently, our treatment of the phorias reminds one of Mark Twain's comment on the weather, that everyone talked a lot, but no one seemed to do much about it. Dr. Peter has helped take the hit and miss from a subject, which has been more missed than hit and whose treatment has been guided largely by the fads and fancies of various exponents, rather than by common sense and intelligent understanding.

From the patient's standpoint, routine post cycloplegic testing prior to prescribing glasses hardly seems entirely justified, even in exophoria. Generally speaking, the first step in restoring ocular comfort to patients with slight phorias consists in making the eyes practically emmetropic. This in the vast majority can be accomplished only by the intelligent use of cycloplegia, especially where astigmia is present. The change of a cylinder, axis or amount known to be correct under cycloplegia because it does not exactly meet a patient's fancy, hardly seems good judgment, often prolongs incapacity and delays recovery.

The subjective symptoms caused by the various phorias are in reality only fatigue reactions. This fundamental fact and deep truth could have been emphasized in greater detail. We must not lose sight of the fact that a person's general fatigue, which is largely dependent upon well being and living habits, often influences the restoration of ocular comfort as much as our local treatment with appropriate glasses or medicine.

The author's discussion of the tropias and paralytic squint is one of the sanest contributions on this subject that I have ever read. The absence of "hobbies" has a strong appeal. Endorsement of sight re-education and fusion training especially after operations should encourage our intelligent continuance of this treatment, which most of us have from time to time neglected.

The complete table of contents and index facilitate on'e knowing what one knows, which after all is one of the most difficult problems of the physician twenty years after graduation.

Dr. Peter is to be congratulated upon this excellent volume and encouraged in contributing ophthalmic publications because ophthalmology needs more books of the quality he has written.

CHAS. A. BAHN, M. D.

Angina Pectoris: The Anatomy, Physiology and Surgical Treatment: By Walter B. Coffery, Philip King Brown and John Davis Humber. New Orleans, A. J. Dickerson. 1927. p. 393.

This monograph, produced in excellent style by the Tulane University Press, contains an outstanding feature extensive anatomical studies, great numbers of the most careful and painstaking dissections of the cervical sympathetic nervous system by Humber. The fine photographs and line drawings of these specimens are beautifully reproduced in half-tone profusely illustrating the section and constitute an unusual atlas of this surgically important system. This contribution is distinctly valuable. The book is made up in its first half from what appear to be separate essays on, for the most part, the surgical aspects of this interesting and important condition. Though the section are related, they are not intimately welded together and one gets the impression of a series of reprintings of articles on the same subject rather than of a single effort carefully blended. There is discussion of the physiology, the diagnosis of the condition, the medical treatment and the surgical treatment with especial emphasis on the method of Coffery and Brown. Case reports are given in great numbers and at great and apparently too great length at times, with the inclusion of many unimportant facts which suggest careless editing and unfortunately give the impression of padding. From the surgical standpoint the work reflects the opinions and convictions of the authors in extenso somewhat at the expense of those of other neurosympathetic surgeons. This is of course authors' license in a monograph. The medical treatment seems to the internist to be unfairly discriminated against for medical methods were apparently rarely given thorough trial in the authors' cases before surgical intervention was undertaken. The electrocardiographic discussion is inadequate. The electrocardiographs on page 126 are upside down. The sequence of case-grouping is difficult to follow and understand in rapid survey of a reviewer.

The directions for the surgical procedure are extensive and will no doubt appeal to the surgeon who has only an infrequent opportunity to undertake sympathectomy. The excellent illustrations of the anatomy of the region will be invaluable to the seasoned as well as the occasional operator in this important field.

GEORGE R. HERMANN, M. D.

Roentgenology: Its Early History, Some Basic Physical Principles and the Protective Measures: By G. W. Kaye, O. B. E., M. A. D. Sc. New York, Paul B. Hoeber, Inc. 1928. pp. 157.

Every roentgenologist in this country know of Dr. Kaye and the great work he has done for radiology. His latest book, Roentgenology, will be in great demand. In this book consideration is given to the history and physics of roentgenology as well as the various protective measures employed in the best roentgen laboratories. Several very interesting historical illustrations and a number of charts appertaining to the physics of the roentgen-ray are to be found in this book. All users of the roentgen-ray will find this little book both interesting and educational.

LEON J. MENVILLE, M. D.

A Compend of Diseases of the Skin: By Jay Frank Schamberg, A. B., M. M. Philadelphia, P. Blakiston's Son & Co. 1928. pp. 324.

The eighth edition of this very fine little volume, contains all the good of previous editions and has added quite a review of syphilis, especially of the nervous system.

This is the book I like to recommend for the class room and ready reference in the practitioner's office. It is complete yet compact.

M. T. VAN STUDDIFORD, M. D.

The Diabetic Life: Its Control by Diet and Insulin. A Concise Practical Manual for Practitioners and Patients. By R. D. Lawrence, M. A., M. D., M. R. C. P. (London). 4th ed. Philadelphia, P. Blakiston's Son & Co. 1928. pp. 188.

There are many things of very great interest suggested in this little book and a doctor who wishes a brief, accurate and authentic review and guide will find it here. The book, however, is much too technical for the average run of patients. The Line-ration scheme is ingenious but in the opinion of the reviewer no easier to teach patients than the straight calculation of the diet.

I. I. LEMANN, M. D.

Recent Advances in Surgery: By W. Heneage Ogilvie, M. A., M. D., M.Ch., Oxon., F. R. C. S. Eng. Philadelphia, P. Blakiston's Sons & Co. 1928. pp. 461.

A good resume of recent progress in surgical fields. The volume compares favorably with a similar work edited by Graham, entitled Year-Book of Surgery. It is a good and convenient reference book.

SHIRLEY C. LYONS, M. D.

The Kahn Test: By R. L. Kahn, M. S., Sc.D. Baltimore, The Williams and Wilkins Co. 1928. pp. 201.

This work consists of an explanation of the phenomena of precipitation in syphilis with reference to the Kahn reaction, with remarks concerning the choice of apparatus, reagents, and standardization of antigen. The author also discusses the various reactions obtained with the Kahn test and their clinical interpretation. The technique for procedures with spinal fluid and the micro and special procedures are also given.

The volume deals entirely with the technique and interpretation of the Kahn test and is an excellent reference for anyone choosing to use this test.

EDWIN H. LAWSON, M. D.

Syphilis: By Charles C. Dennie, B. S., M. D., New York, Harper & Brothers. 1928. pp. 304.

This little book cites the personal views of the Author as expressed in the "Foreword." It is a very nice compends on syphilis but is lacking in details and illustrations. The table of contents is fairly complete but there is no index in the back of the book which adds to its inconvenience as a reference.

MONROE WOLF, M. D.

Medical Department of the United States Army in the World War: By Maj. Albert S. Bowen, M. C. Vol. IV. Washington, U. S. Government Printing Office. 19[illegible]. pp. 494.

The fourth volume of this enormous history of the Medical Department of the World War has to deal with the mobilization camps and ports of embarkation, and of the activities in these several important departments under the control of the medical corps. This volume has been compiled with the same careful attention to details and to minutiae as the other volumes that have already appeared.

J. H. MUSSER, M. D.

Clinical Examination of the Nervous System. By G. H. Monrad-Krohn, M. D., F. R. C. P.; with a foreword by T. Grainger Stewart, M. D., F. R. C. P. 4th ed. New York, Paul B. Hoeber, 1928. pp 209.

This book is just what it purports to be, a manual for the clinical examination of neurological patients. The author has undoubtedly achieved his purpose, and presents a work which will be of great value to neurological beginners and to students. It will enable them to systematize their neurological examinations and make them more complete and thorough. The material that he gives can, of course, be obtained from other works, but here it is condensed and in such a form as to be instantly available for use. Furthermore he describes many details as to the technique of eliciting signs and making tests, which should be extremely useful and of great assistance to anyone taking up neurology.

E. McC. Connely, M. D.

A Handbook for the Diabetic: By Albert H. Rowe, B. S., M. S., M. D. New York, Oxford University Press, 1928. pp. 129.

Another of the numerous guides for the diabetic patient and his physician. This one is very plainly written though it contains, as do most of the primers in the opinion of the reviewer, too many details for the average patient. On the other hand, any physician who will take this little book and digest its contents should be able to handle adequately the diabetic patients who come to him. There are a number of pieces of detailed advice as to arrangement of the diet and the administration of the insulin which will prove of value to the doctor. This book is recommended to him as one of the dependable and easily understood primers.

I. I. Lemann, M. D.

A Handbook of Clinical Chemical Pathology: By Frank Scott Fowweather, M. D., M.Sc., D. P. H. (Liverpool), F. I. C., with foreword by Sir Berkeley Moynihan, Philadelphia. P. Blakiston's Son & Co. 1929. pp. 216.

This little book fills a great need in medicine as there is nothing quite like it in medical literature, despite the fact that the information it contains is continually sought for. Here it is gathered up and discussed, rather superficially, it is true, but with sufficient detail for the man who seeks such facts as it contains. A brief and succint chapter is devoted to such phases of chemical pathology as acid-base balance of the blood, renal function tests, liver function tests, examination of the cerebro-spinal fluid, basal metabolism, anoxemia, together with vitamins and deficiency diseases, as well as some nine other chapters devoted to somewhat less important and less frequently sought after subjects. The book should prove of great value to the clinican or any medical man is not actively carrying out laboratory procedures, but who is anxious to know the why and the wherefore and the results.

J. H. Musser, M. D.

The Adrenals: Their Physiology, Pathology and Diseases: By Max A. Goldzieher, M. D. New York. The Macmillan Co. 1929. pp. 426.

A monographic description of the adrenal glands including their normal and pathological morphology and function, the interpretation of morphological changes and functional disturbances and their relation to clinical medicine. In clinical medicine today very little attention is paid to adrenal disturbances. Practically speaking, the only item of adrenal pathology which is taken into consideration by the average physician is that of complete adrenal insufficiency, leading to Addison's disease. This volume is an attempt to demonstrate that quite definite conclusions can be drawn in order to establish several other syndromes, besides Addison's disease, which are by no means as rare and unimportant as generally considered. Furthermore, in various syndromes which are brought about by the impairment of other organs than the adrenals, the latter also play a secondary role, which deserves attention both from a diagnostic and thereapeutic point of view.

The book opens with a chapter on the development of the adenals. There is a striking parallelism between the ontogenesis and phylogenesis of cortex and medulla. At first there is complete separation of the two systems: fish stage; next, close contact of the two tissues: amphibia stage; then the intermingling of the two components: bird stage; and eventually the complete inclusion of the phaeochrome tissue by the interrenal element and formation of a unified organ: mammal stage.

The third chapter of something over a hundred pages, deals with the physiology of the adrenals. The effects of adrenalectomy are reviewed, attention being called to such things as the striking loss of weight, pulmonary over-ventilation, the decrease of alveolar CO_2, decrease in blood alkali reserve, rise in temperature, nitrogen and sulphate metabolism, etc. The specific effect of adrenalin on the heart, the intestines, uterus, the eye, the bronchus, muscular fatigue, glandular organs, the blood, metabolism (gaseous, salt,

carbohydrate), are discussed as well as the effects of drugs, the influence of the pancrease and of other endocrine correlations.

Although the demonstration of cholin in extracts of the adrenal cortex and in its efferent veins might suggest the possibility of this substance being the sole and only active principle, a survey of its properties shows that it can not account for all of the manifold effects of the physiological function of the cortex or for those of its pathological dysfunction. Some preliminary work by the author, attempting to demonstrate the presence of another active substance (interrenin) is here referred to.

Chapters 4 and 5 deal with the pathological anatomy and the patho-physiology of the glands. The last chapter, refreshingly short, discusses the general principles of adrenal organotherapy.

The book is well illustrated, there being 72 microphotographs most of which illustrate the chapter on pathological anatomy. The bibliography occupies 97 pages. A perusal of the book will repay the clinician as well as the more physiologically inclined and one closes it with the feeling that the adrenals have many quite important functions and correlations.

HENRY LAURENS, Ph.D.

National Health Series: What Every One Should Know About Eyes: By F. Park Lewis, M. D. Care of the Mouth and Teeth, by Harvey J. Burkhart, D. D. S. Diabetes and Its Treatment, by Frederick M. Allen, M. D. New York, Funk & Wagnalls Company. 1928.

Three little booklets written by well known authorities on their subjects, carefully prepared for the laity. They are desirable and well worth while for the person interested in personal hygiene.

J. H. MUSSER, M. D.

Practical Medicine Series—General Medicine—Series 1928: Ed. by George H. Weaver, M. D., and others. Chicago, Year Book publishers. 1928. pp. 832.

The practical medicine series has been in existence too long to require any introduction to the medical public. The reviewer has watched, with particular interest, the development of the volume on general medicine during the past thirteen years. Much credit is due to its editors for its present high standard. While it is manifestly impossible to review and abstract all the valuable articles that have appeared in internal medicine during the past year in a comparatively small volume, much good judgment in selection has been shown throughout the book. Papers of outstanding merit are reproduced, at times, in toto. Here and there editor's notes are inscribed endorsing or disagreeing with conclusions reached by authors of papers. This adds a personal touch to the book which enhances its value and interest. The reviewer can highly recommend this volume to the busy practitioner who is desirous of keeping up with the recent literature in general medicine.

RANDOLPH LYONS, M. D.

PUBLICATIONS RECEIVED.

P. Blakiston's Son & Company, Philadelphia: Recent Advances in Obstertrics and Gynecology, by Aleck W. Bourne, B. A., M. D. B. Sch. (Camb.), F. R. C. S. (Eng.). The Diagnostics and Treatment of Tropical Diseases, by E. R. Stitt, A. B., Ph.G., M. D., Sc.D., LL.D. Recent Advances in Neurology, by W. Russell Brain, M. A., D. M. (Oxon.), M. R. C. P. (London).

D. Appleton and Company, New York and London: Proctology, by Frank C. Yeomans, A. B., M. D., F. A. C. S.

Paul B. Hoeber, New York: Imperative Traumatic Surgery, by C. R. G. Forrester, M. D., F. A. C. S.

Bruce Publishing Company, Saint Paul: Modern Roentgen-ray Technic, by Ed. C. Jerman.

MacMillan Company, New York: Getting Ready to be a Mother, by Carolyn Conant Van Blarcom, R. N. Diseases of the Liver, Gall Bladder and Bile Ducts, by Sir Humphry Rolleston, Bart., K. C. B. and John William McNee, D. S. O., M. D., D.Sc., F. R. C. P.

Lea & Feibiger, Philadelphia: Diseases of the Gall Bladder and Bile Ducts, by Evarts Ambrose Graham, A. B. M. D., Warren Henry Cole, B. S., M. D., Glover H. Copher, A. B., M. D. and Sherwood Moore, M. D. Acute Infectious Diseases, by Jay Frank Schamberg, A. B., M. D., and John A. Kolmer, M.Sc., M. D., Dr. P. H., D.Sc., LL.D.

Funk & Wagnalls Company, New York and London: Diabetes and Its Treatment, by Frederick M. Allen, M. D. Care of the Mouth and Teeth, by Harvey J. Burkhart, D. D. S., LL.D. What Every One Should Know About Eyes, by F. Park Lewis, M. D., F. A. C. S.

U. S. Government Printing Office, Washington, D. C.: The Medical Department of the United States Army in the World War. Volume IV. Activities Concerning Mobilization Camp and Ports of Embarkation, by Maj. Albert S. Bowen, M. C.

Williams & Wilkins Company, Baltimore: Practical Clinical Laboratory Diagnosis, by Chas. C. Bass., M. D. and Foster M. Johns, M. D.

Reprints: Studies on Hookworm, Ascaris, and Trichuris in Panama, by W. W. Cort, N. R. Stoll, W. C. Sweet, W. A. Riley and Louis Schapiro A. Series of Reprints from the Director, Geneeskundig Laboratorium, Weltevreden (Java) Dutch East India.